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# Record of Decision

## Logan Creek Ecosystem Restoration Project

Flathead National Forest  
Tally Lake Ranger District  
Flathead County, Montana

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**RECORD OF DECISION**  
  
for the  
  
**LOGAN CREEK ECOSYSTEM  
RESTORATION PROJECT**

**Flathead National Forest  
Tally Lake Ranger District  
Flathead County, Montana**

**Cathy Barbouletos,  
Responsible Official**

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## Introduction

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This Record of Decision explains my decision to implement management activities within the Logan Creek Area to accomplish the following objectives:

- Reduce hazardous fuels that currently put the area at risk of wildfire.
- Restore a pattern of vegetation across the landscape that reflects historical conditions.
- Reduce the vulnerability of the forest to large-scale disturbances from insects and disease, particularly the Douglas-fir bark beetle.
- Provide an ecosystem that sustains wildlife species.
- Improve water quality and reduce sediment delivery to streams.
- Improve aquatic habitat to enhance the recreational fishery.
- Provide for economically viable removal of commercial timber to contribute to the social and economic needs of our local communities.

To accomplish these objectives, **I have decided to implement Alternative F**, which is the Preferred Alternative described in the Final Environmental Impact Statement (FEIS) for the Logan Creek Ecosystem Restoration Project. In this Record of Decision document, I will refer to Alternative F as the Selected Alternative.

The Selected Alternative will accomplish the above objectives while protecting resources. Components of the Selected Alternative include timber harvest; prescribed burning; precommercial thinning; an array of road-related activities such as road construction, road reclamation, road rehabilitation, and road restrictions; and several resource rehabilitation projects. The Selected Alternative is described in detail in Appendix A of this document.

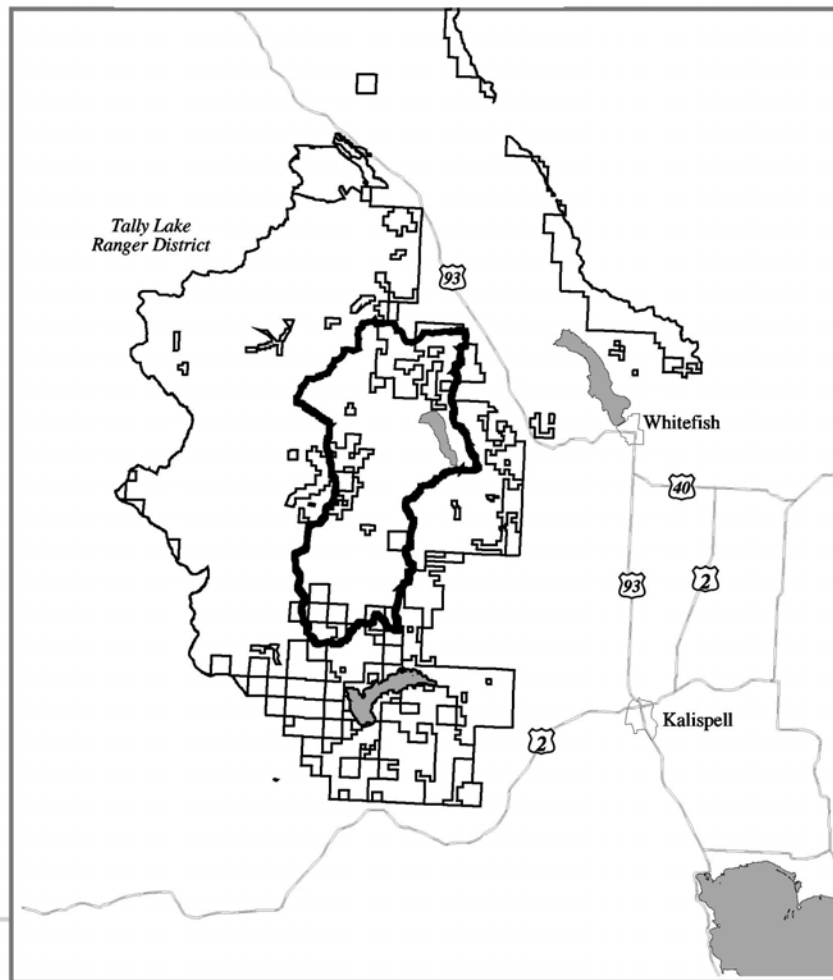
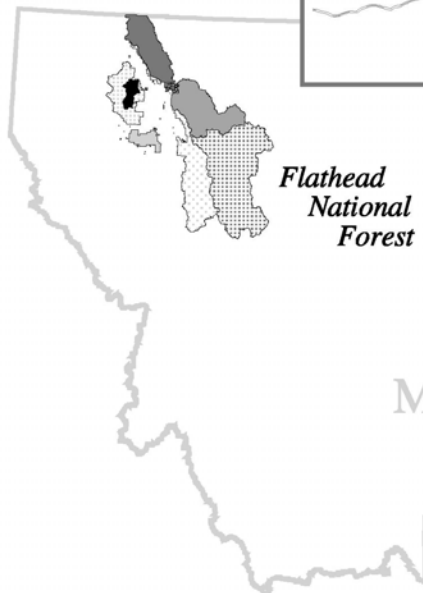
The area analyzed for proposed management in the FEIS (hereafter referred to as the Logan Creek Area) is located in Flathead County and is approximately 15 air miles west of Whitefish, Montana (refer to Vicinity Map Figure 1). It encompasses the entirety of the Logan Creek watershed except for the Sheppard and Griffin Creek sub-drainages. Because the Sheppard and Griffin subdrainages were extensively evaluated and management projects implemented in the mid-1990s, the Logan Creek Restoration Project FEIS and Record of Decision did not consider proposing activities in these two drainages.

The Logan Creek Area analyzed in the FEIS encompasses approximately 61,000 acres, with about 48,000 acres of this in National Forest System lands. The other ownerships include State of Montana, Plum Creek Timber Company, F.H. Stoltze Land and Lumber Company, and a number of private individuals. **Activities outlined for implementation in this Record of Decision will occur only on National Forest System lands.** Detailed information about the Logan Creek Area is presented in Chapter 1 of the FEIS.

Figure 1. Project Vicinity Map

# Logan Creek

*Vicinity Map*



My decision is based on information developed through an extensive environmental analysis process, which is presented in the Logan Creek Ecosystem Restoration Project FEIS and its Project File. The FEIS describes in detail the purpose and need that generated the Proposed Action; the issues identified by the public and agency personnel; the alternatives developed to address issues; and the environmental, social, and economic effects associated with each alternative. I also considered comments from members of the public, other agencies, and organizations (Exhibits C-1 through C-76 and FEIS Appendix F).

The results of recent fieldwork have also influenced my decision. In the summer of 2003, Forest Service resource specialists repeatedly visited the Logan Creek Area to refine their recommendations for the area. For example, they identified some acreage where the Douglas-fir beetle infestation is more severe than when the environmental analysis began for this project over a year ago. In other cases, recent fieldwork updated previous timber stand data or indicated areas that should not be treated out of concern for other resources. New information from recent fieldwork is incorporated into Alternative F, the Selected Alternative.

The Proposed Action (Alternative B) and three action alternatives (Alternatives C, D, and E) were developed during the relatively early stages of the analysis process. The No-Action Alternative A, required by law to be included in the analysis, involves no management actions and was also incorporated into the analysis. The Preferred Alternative, Alternative F, was developed after extensive public comment on the Draft Environmental Impact Statement (DEIS) for this project. All five action alternatives presented in the FEIS address the purpose and need objectives for this project. I decided to choose for implementation the Preferred Alternative, Alternative F, because it best addresses the purpose and need for action while balancing environmental concerns for resources such as water quality and wildlife security.

## Purpose and Need for Action \_\_\_\_\_

In making my decision, I considered how each alternative meets the purpose and need for action while addressing each of the environmental issues, which will be described in the next section. The purpose and need objectives were developed from an extensive watershed-area assessment of the Logan Creek Area that was published in September 2001. The purpose and need objectives are described in detail in Chapter 1 of the FEIS and are summarized here:

- **Reduce hazardous fuel.** Wildland fire suppression in the Logan Creek Area over the last six decades has been so effective that the largest wildland fire since 1940 was only 30 acres; most of the fires were only a few acres. The disparity is dramatic between the statistical average of acres burned per century since wildland fire suppression began in 1940 (nearly 250 acres) and the acreage that is estimated to have burned per century before this date (nearly 41,000 acres). It is not surprising that unmanaged forest stands have accumulated high levels of hazardous fuels that currently make the area at risk for uncharacteristically high-intensity wildland fires that adversely affect forest resources.

The Logan Creek Ecosystem Restoration Project proposes to reduce hazardous fuels and re-establish vegetative conditions so forest stands become resistant to more frequent low- to moderate-intensity wildland fires. In turn, these actions would help reduce the likelihood of severe wildland fires, which would protect values such as adjacent private property, recreational areas, cultural resources, timber values, and water quality from the catastrophic effects of high-intensity wildland fire.

The Forest Service has been concerned for years about the increasingly high accumulations of hazardous fuels in our forests. Recently, this concern has begun to receive widespread public support. Since the Draft Environmental Impact Statement was published in the spring of 2003, northwest Montana experienced one of its most severe fire seasons in recorded history. A number of letters to the editor of local newspapers have focused on the need to reduce hazardous fuels in the urban/wildland interface. In fact, the Whitefish City Council passed a resolution in early September 2003 that called for increased active management of state and federal forests with an emphasis on hazardous fuels management.

- **Restore historical vegetative cover types and structure classes.** Exclusion of fire for more than 60 years has resulted in a change in forest structure and cover types within the Logan Creek Area. Currently, forest stands are denser and have considerably more Douglas-fir than existed before fire suppression efforts began about 1940. Stand density needs to be reduced, and the forest needs to support more western larch and ponderosa pine. These two species historically were a larger proportion of overall forest composition in the Logan Creek Area than they are now.

Another component of vegetative conditions that has changed since fire suppression is patch size, which is the size of contiguous forest areas created by disturbance. Historically, patches of between 100 to 600 acres were created by fire and were much larger than they are today. In particular, seedling/sapling patch size is currently 80 acres, which is much smaller than historical conditions. Because plants and animals have adapted to disturbance patterns and patch sizes of previous millennia, current patch sizes should ideally imitate the patch sizes of past centuries.

Many sapling-sized stands in the Logan Creek Area are currently overstocked (i.e., growing more trees than is desired) which will lead to slow growth of individual trees, poor stand vigor, domination by one or two species, and susceptibility to insects, disease, and wildland fire. These stands should be thinned to improve future mature forest conditions.

- **Reduce the vulnerability of the forest to disturbances.** The Douglas-fir bark beetle has been killing many of the mature Douglas-fir that cover a large portion of the Logan Creek Area. In part, this has resulted from overstocked stands with intense competition among trees, a situation that has resulted in weakened individual trees that are therefore susceptible to bark beetle attack. A multi-year drought has also made Douglas-fir in the area more susceptible to bark beetle attack. Thinning stands of Douglas-fir would benefit residual trees by providing them better growing conditions, even during drought years when they are particularly susceptible to beetle attack. Converting some stands to species resistant to Douglas-fir bark beetle and root disease



(i.e., western larch, lodgepole pine, and ponderosa pine) can also reduce the spread of beetles across the landscape and create a future stand less likely to experience mortality from these two agents. Timber harvest methods used to achieve this purpose would include salvage of dead and dying timber.

- **Provide habitat for wildlife species.** There is a need to move the landscape toward historical vegetative conditions caused by wildland fire to which local wildlife species are adapted. Frequent fires in previous centuries created the following conditions across the landscape: extensive snag and downed woody material, a variety of stand ages and tree densities, and connectivity of habitats. Some areas that burned particularly frequently maintained an open, park-like forest that was conducive to such wildlife species such as flammulated owls and northern goshawks. Other frequently burned areas provided excellent summer range for ungulate species.

Another wildlife concern in the Logan Creek Area is providing secure habitat for species such as elk and deer. Currently, motorized access is allowed in most areas of contiguous cover that function as wildlife security areas during the hunting season. There is need to prohibit motorized access on some trails and roads to increase wildlife security.

- **Improve water quality and reduce sediment.** There is a need to reduce the amount of surface water and sediment routed from roads to the tributaries and mainstem of Logan Creek. Improving system roads up to Montana Best Management Practice standards (BMPs) can reduce sediment by as much as 80 percent when properly applied and creates a more natural drainage pattern across forested hillsides, thereby reducing potential for erosion within stream channels. Roads can be relocated or reclaimed when located on sensitive or wet landtypes and/or when not necessary for future management. This, in turn, would help decrease peak flows from runoff events and reduce sediment delivery to streams.
- **Improve aquatic habitat and enhance fisheries.** Brook trout, rainbow trout, and lake trout have established healthy populations in the Logan Creek watershed and provide a popular recreational fishery. Although it may not be apparent to the casual observer, the quality of fish habitat in the Logan Creek drainage has declined. Early 20<sup>th</sup> century log drives substantially reduced pool habitat in lower Logan Creek. Road building and timber harvest primarily associated with management in the 1950s and '60s have contributed to sediment deposition in streams. Upgrading forest roads to BMP standards would reduce the risk of sediment and excess runoff entering streams during storm events, thereby protecting fish habitat. Some road culverts throughout the watershed are barriers to fish migration and prevent fish from utilizing high-quality habitat. Restoring and protecting habitat would benefit fish species and other aquatic organisms, therefore improving fishing opportunities.
- **Provide economically viable removal of timber.** The level of timber harvest on the Tally Lake Ranger District directly contributes to the local economy. It affects current income, employment, and county revenues. The Flathead Land and Resource Management Plan (1986), commonly called the "Forest Plan," designates much of the

Logan Creek Area as land on which the production of timber should be emphasized, while protecting the productive capacity of the land and timber resource.

## Public Involvement

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Public involvement helps the Forest Service identify concerns about possible effects from its proposals. It is also a means of disclosing to the public the nature and consequences of actions proposed for National Forest System lands.

Public participation began in July 2000 when the Tally Lake District Ranger mailed a letter requesting comments on the Logan Creek watershed-level assessment, the initial study of the Logan Creek area, which is described at the beginning of FEIS Chapter 1. In August 2000, she conducted open houses at the Hope Ranch in Star Meadow and the Tally Lake Ranger District office, which provided an opportunity for the public to become familiar with the Logan Creek drainage, possible projects, and to provide general input to the Forest Service's data gathering effort for the assessment. In September 2001, the planning team completed the assessment and published a summary document. This document was mailed to the individuals and groups who previously expressed interest in the findings.

After the initial watershed assessment recommended several management actions and project-level planning began, a public involvement strategy was developed to ensure that potentially interested members of the public and other government agencies received timely information about the upcoming analysis so they may participate in the process (Exhibit B-1a). The Forest Service developed a list of members of the public and agencies who may be interested in the Logan Creek project.

In late 2001 and early 2002, the Tally Lake Interdisciplinary Team developed a Proposed Action from the management recommendations and data collected in the watershed assessment that also addressed the seven Purpose and Need objectives listed in the previous section of this ROD. The Logan Creek project first appeared the Forest's Schedule of Proposed Actions (SOPA) in the summer of 2001. This project appeared quarterly in the SOPA since then.

In March 2002, the District Ranger mailed the Proposed Action and a letter requesting comments to individuals, groups, and agencies they previously identified. In addition, a legal notice was published in the *Daily Interlake* requesting comments. Twenty letters and 11 telephone calls were received in response to this mailing. In April 2002, an open house was held at the Tally Lake Ranger District office and was attended by 11 members of the public. In October 2002, a field trip was held and attended by 13 members of the public. The majority of the attendees at the open house and field trip were private landowners within the project area who were interested in fire prevention and effective fuel reduction in the wildland urban interface.

All comments received were considered, and a decision was made to produce an Environmental Impact Statement as the best level of analysis and documentation for the Logan Creek project. The Notice of Intent (NOI) was published in the Federal Register on August 12, 2002. The NOI asked for public comment on the proposal from August 12 to

September 12. The NOI generated two responses. Many of the responses to the proposed action cited scientific literature and requested the Interdisciplinary Team to consider this research. An attempt was made to locate and review this literature if team members were not already familiar with the research referenced and provide it to team specialists. The result of this literature search is displayed in Exhibit C-23.

Comments generated from the Forest Service's request for comments on the Proposed Action and/or the NOI published in the Federal Register were analyzed using the content analysis process. Content analysis is a systematic process to compile, categorize, and capture the full range of public viewpoints and concerns regarding a plan or project. Content analysis helps the planning team clarify, adjust, or use technical information to prepare the Final EIS. Information from public meetings, letters, emails, faxes, phone calls, and other sources are all included in this analysis. This process makes no attempt to treat comments as votes. Content analysis ensures that every comment is considered at some point in the decision process. The content analysis is presented in Exhibits C-21, C-49, and C-57.

To analyze the input, a list of comments was created. This list identifies specific requests expressed by individuals and groups who responded to requests for input. To develop the list, each letter was read and representative quotations were selected that best capture the respondent's sentiments in the form of an action the Flathead National Forest should consider pursuing. A response from the interdisciplinary team follows each concern. The list of comments to the proposed action from the public and the responses from the IDT are in Exhibit C-65.

A list of agencies, groups, and individuals contacted or consulted throughout the entire public involvement process is in Chapter 4 of the FEIS. At the request of the Tribe, participation with the Salish and Kootenai Tribe was conducted during quarterly meetings between tribal representatives and the Flathead National Forest Heritage Resource specialists.

Using the comments received on the Proposed Action, the IDT developed a list of issues to address. These issues are discussed in the next section of this document.

The DEIS was published in late May 2003 and posted on the Forest's web site with a 45-day comment period. On May 29, the Tally Lake Ranger District hosted an open house at the Ranger Station in Whitefish to further answer questions and solicit comments about the DEIS. Nine letters, phone calls, or personal visits that focused on the DEIS were received from members of the public or other government agencies. Content analysis as described above was used on the comments received on the DEIS; however, the low number of input letters allowed the Interdisciplinary Team to only create the list of comments and responses without the categorization used in the response to the Proposed Action. The summary of comments from the public and the responses from the Interdisciplinary Team are included in Appendix F of the FEIS. These comments helped develop Alternative F, which I have chosen to implement as the Selected Alternative.

A few responses to the DEIS cited scientific literature. An attempt was made to locate and review this literature and provide it to team specialists if team members were not already familiar with the research. The result of this literature search is displayed in Exhibit C-75.

The complete documentation of public participation and media coverage is contained in Exhibit sets B, C, and D.

## Issues

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An *issue* is defined as a point of discussion, debate, or dispute concerning environmental effects of an action. Issues are identified through the public involvement process and by review from other agencies and Forest Service personnel. The scoping process is used not only to identify important environmental issues, but also to identify and eliminate issues that do not pertain to the action, narrowing the scope of the environmental documentation process accordingly. Therefore, impacts are discussed in proportion to their importance.

To identify issues specific to the Logan Creek project, the Interdisciplinary Team studied public comments and information about historical and current conditions within the analysis area. They also reviewed the Flathead National Forest Plan and other site-specific planning documents relevant to the Logan Creek watershed to further develop a list of issues. The Forest Service separated the issues into two groups: key and non-key issues. Key issues were defined as those directly or indirectly caused by implementing the Proposed Action. Non-key issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-key issues and reasons regarding their categorization as non-significant may be found at Exhibit C-21.

As for key issues, the Forest Service identified the following issues during the scoping phase of public involvement. Alternatives were developed in response to these key issues. The ID team also determined what "*issue indicators*" to use to measure how each alternative responded to identified issues. Each alternative is evaluated in terms of how it addresses issue alternatives (Table 3 of this document). The key issues are presented and discussed below:

The key issues are described in detail in Chapter 1 of the FEIS and are summarized below. Input from members of the public that generated the issues are identified at the end of each issue statement by Project File exhibit number.

- 1. Wildlife security.** This issue stems from concerns about the Proposed Action that the various types, amounts, and distribution of timber harvest, prescribed burning, and roaded access would reduce the area's ability to provide wildlife security over the short term (0 to 15 years), with particular concern about elk habitat security. Timber harvesting under the Proposed Action may reduce the amount of secure hunting season elk habitat. This habitat could be provided through proposed restrictions on motorized public access on some roads and trails. Another aspect of wildlife security is protection from habitat loss, such as removal of dead trees and downed logs by firewood cutting. Timber harvest and road access changes could also affect the amount and quality of habitats vulnerable to firewood cutting (Exhibits C-12, C-13, C-17).

2. **Old growth habitat and mature forests.** The Proposed Action would involve timber harvesting within and adjacent to late seral/structural stage forests (mature forests) and within areas that are currently rated as old growth habitat, but have continuing mortality from Douglas-fir beetle. Such mature and old growth forests are particularly valuable habitat for some wildlife species. Harvesting and road building adjacent to old growth habitat can remove the buffering edge and expose interior old growth habitat and species to adverse conditions, which could reduce old growth habitat values. As well, harvesting and road building in mature and old growth forests has the potential to sever interconnections between such habitats within the Logan Creek area that is already quite fragmented (Exhibits C-12 and C-14).
3. **Landscape patterns—connectivity.** The Proposed Action would sever or constrict forested connections in numerous places that serve as wildlife travel corridors between important habitats such as riparian forests and ridgelines. Such forested cover is needed by many wildlife species that use the analysis area, such as Canada lynx or fisher, to travel between important habitat such as riparian forests and ridgelines or from one patch of old growth habitat to another. Many other species are not as dependent on forested connectivity, but it better enables them to make use of available habitat with less chance of disturbance or displacement from humans or predators (Exhibit C-17).
4. **Landscape patterns—seral/structural stage patch size and shapes.** The Proposed Action would increase the size of early-seral/structural stage (seedling-sapling) patches to make current conditions more closely emulate what existed in previous centuries. To accomplish this purpose and need objective, the patch size and continuity of late seral/structural stage forests (mature forests) would decrease. This has the potential to reduce or further fragment mature forests (the Interdisciplinary Team generated this issue).
5. **Water quantity and fine sediment deposition.** Mathematical models indicate that four sub-drainages in the Logan Creek area—Reid, Pike, Bill, and Cyclone Creeks--have experienced recent elevated water yields or peak flows. Field data from these drainages confirm there is a high potential that past management activities may be adversely affecting channel stability, which could lead to fine sediment deposition. The Proposed Action includes additional timber harvest and road management activities within these four drainages that have the potential to cause at least short-term increases in water yields, peak flows, and sediment delivered to streams above and beyond what now occurs (Exhibits C-12, C-14, and C-17).
6. **Road access.** The Proposed Action involves road reclamation, which could reduce access for fire suppression and recreation, as well as potentially limit future management opportunities. The opposite perspective of this issue is that the Proposed Action does not reduce enough road miles to maintain wildlife security, improve water quality, and reduce the risk of human-caused ignition of fires (Exhibits C-3, C-4, C-6, C-7, C-8, C-12, C-13, C-14, C-16, C-19).

## Alternatives

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A total of nine alternatives were considered in the DEIS (Chapter 2). Four were dropped from detailed analysis in both the DEIS and FEIS because they were either outside the scope of one or more of the purpose and need objectives, would be impractical to implement because of limited funding opportunities, and/or were determined to have components that would cause unnecessary environmental harm. The DEIS and FEIS for the Logan Creek Ecosystem Restoration Project analyzed in detail these six alternatives:

- The *No-Action Alternative* (Alternative A) that involves no management activities to address the purpose and need for action.
- The *Proposed Action* (Alternative B), designed to address the purpose and need for action.
- Three *action alternatives* (Alternatives C, D, E) that were included in the DEIS and FEIS and were designed to address the purpose and need for action while emphasizing one or more key issues.
- One Preferred Alternative (Alternative F), newly presented in the FEIS, that was developed to respond to the purpose and need for action as well as to public and agency comments on the DEIS. These comments and the Forest Service's responses to these comments are presented in Appendix F of the FEIS. **The Preferred Alternative, Alternative F, is the alternative that I have decided to implement and is therefore called the Selected Alternative in this document.**

A detailed discussion of the public involvement process that led to development of the alternatives is a component of Chapter 1 in the FEIS. Each of the six alternatives listed above is described in detail in Chapter 2 of the FEIS; the Selected Alternative is presented in detail in Appendix A of this document. The features of all six alternatives are discussed below and summarized in ROD Table 1.

### ALTERNATIVE A: NO-ACTION ALTERNATIVE

If the No-Action Alternative were implemented, current management plans would continue to guide management of the Logan Creek Area. No fuel reduction, timber harvest, road improvements, or access changes would be implemented to accomplish project goals. None of the actions proposed in any of the other alternatives would occur.

The No-Action Alternative would not address the purpose and need for action. This alternative is required by the National Environmental Policy Act of 1969 (40 CFR 1501.7), in part because it offers a baseline for evaluating the effects of the action alternatives.

ROD Table 1. Summary of the Features of the Alternatives.

Feature	Alt. A <i>No Action</i>	Alt. B <i>Proposed Action</i>	Alt. C <i>Wildlife Security</i>	Alt. D <i>Old Growth and Connectivity</i>	Alt. E <i>Soil and Water</i>	Alt. F <i>Selected Alternative</i>
Road Reclamation	0	16.2 miles	16.2 miles	16.2 miles	16.6 miles	16.6 miles
Change in road restriction, open yearlong to closed yearlong <i>by a gate</i>	0	4.2 miles	4.2 miles	4.2 miles	6.2 miles	6.2 miles
Change in road restriction, open yearlong to closed yearlong <i>by road reclamation</i>	0	2.7 miles	2.7 miles	2.7 miles	1.3 miles	1.3 miles
Change in Road Restriction, total mileage changed from open yearlong to closed yearlong	0	6.9 miles	6.9 miles	6.9 miles	7.5 miles	7.5 miles
Change in Road Restriction, open yearlong to closed seasonal	0	0	0.7 miles	0	0	0
Change in Trail Restriction, motorized to seasonally nonmotorized	0	0	17.5 miles	0	0	12.7 miles
Temporary road construction	0	5.4 miles	3.6 miles	4.3 miles	4.9 miles	4.5 miles
System road construction	0	4.4 miles	2.7 miles	2.7 miles	4.7 miles	3.8 miles
Road Rehabilitation	0	141 miles	99 miles	124 miles	138 miles	133 miles
Trail construction	0	2000 feet	2000 feet	2000 feet	2000 feet	2000 feet
Timber volume estimate in million board feet	0	58.6	34.0	37.5	54.0	42.7
Total harvest acres	0	6624	4235	4724	6315	5521
- Light dispersed retention	0	921	430	311	829	523
- Moderate dispersed retention	0	4737	2549	2895	4231	3093
- Heavy dispersed retention	0	966	1256	1518	1255	1809
- Heavy aggregated retention	0	0	0	0	0	96
Precommercial thinning acres	0	3783	3783	310	3783	310
Fuel Reduction Projects						
- Prescribed burning acres	0	566	566	566	566	566
- Hand fuels treatment acres	0	182	182	182	182	182
- Fuel reduction acres in precommercial thin areas	0	83	83	15	83	15
Large Woody Debris placement in streams for fish habitat	0	3.7 miles	3.7 miles	3.7 miles	3.7 miles	3.7 miles
Pool construction sites for fish habitat improvement	0	5	5	5	5	5
Riparian planting of shrubs & conifers for wildlife habitat in previously harvested areas	0	90 acres	90 acres	90 acres	90 acres	90 acres
Planting of shrubs for wildlife habitat in newly harvested areas	0	100 – 500 acres	100 – 500 acres	100 – 500 acres	100 – 500 acres	100 – 500 acres

## **ALTERNATIVE B: THE PROPOSED ACTION**

This alternative is the original Proposed Action developed in late 2001 and early 2002 to address the purpose and need for action while responding to goals and objectives outlined in the Forest Plan. Of all the alternatives, Alternative B best addresses the purpose and need for action objectives presented earlier in this document, but detailed analysis in the DEIS and FEIS has indicated that it poses some unacceptable environmental impacts.

## **ALTERNATIVE C: WILDLIFE SECURITY**

Alternative C seeks to maintain and enhance security values for elk and numerous other wildlife species while addressing the purpose and need objectives. It addresses Issue #1 (Wildlife Security) and Issue #6 (Road Access). Alternative C was developed using the Proposed Action, Alternative B, as the base. This alternative dropped some harvest units and road building and increased the number of trees retained in some other harvest units to maintain wildlife hiding cover and security. Additional road restrictions beyond those outlined in the Proposed Action are included in this alternative to expand elk security areas.

## **ALTERNATIVE D: OLD GROWTH AND CONNECTIVITY**

Alternative D was designed to respond to concerns about protecting old growth habitat and maintaining the forested connections across the landscape that are used as travel ways and cover between larger blocks of forested wildlife habitat while addressing the purpose and need objectives. It addresses Issue #2 (Effects on existing old growth habitat and on late-seral/structural stage forests), Issue #3 (Landscape patterns—connectivity), Issue #4 (Landscape patterns—seral/structural stage patch size and shapes), and Issue #6 (Road access).

## **ALTERNATIVE E: AQUATIC RESOURCES**

This alternative responds to issues raised involving water quality, water yield changes, and possible increases in sediment that may affect aquatic habitat while addressing the purpose and need objectives. It addresses Issue #5 (Water quantity and fine sediment deposition) and Issue #6 (Road access). Alternative E was developed using the Proposed Action as the base. However, Alternative E reduced the amount of timber harvest and road building in the Reid, Pike, Bill, and Cyclone Creek drainages where measured channel conditions and mathematical modeling of the existing condition suggest that they are currently being affected by increased water yield and peak flows. Even with reductions in timber harvest and road building in these four drainages, some water yield increase is still predicted. Additional reductions were not made because most of the remaining units in Alternative E are commercial thinnings or salvage harvests, which would cause minimal water yield increases.

A notable feature of Alternative E is that its road reclamation plan better addresses water resource issues than Alternatives B, C, and D because it targets roads for reclamation that most need reclamation, as determined by recent field surveys. In addition, road improvements for the Logan Creek Road 913 between Tally Lake and the Star Meadow Road are proposed to address chronic sediment deposition in Logan Creek, a stream listed as impaired on the State of Montana's 303(d) list. Alternative E involves more road construction than



Alternatives B, C, and E because a portion of road 2913 close to a tributary of Reid Creek will be obliterated and reconstructed further from the stream on the bench above the riparian area.

## **ALTERNATIVE F: THE SELECTED ALTERNATIVE**

Alternative F was identified in the FEIS as the Preferred Alternative; in this Record of Decision, it is referred to as the Selected Alternative. It was developed in response to analysis in the DEIS and public comments on the DEIS; the latter are displayed in Appendix F of the FEIS. It addresses the purpose and need for action to the greatest extent possible, while negatively impacting resources to the least extent possible. Table 1 of this document compares features of the Selected Alternative with the other alternatives; Appendix A of this document presents a detailed description of the Selected Alternative.

Alternative F was developed using the Proposed Action as a base, but includes components and concepts from all the action alternatives described in the DEIS. It proposes fewer miles of road construction than the Proposed Action and has the same road reclamation plan as Alternative E, which better targets roads for reclamation based on effects than did the Proposed Action. Many vegetation treatment units in Alternative F are reduced in size to create a buffer between unit boundaries and stands currently identified as old growth. Retention levels within stands (i.e., density of the trees retained within units) sometimes increased compared to the Proposed Action in response to concerns over wildlife connectivity and cover, concerns over impacts to streams and fisheries habitat, and/or in response to updated stand survey information. Several units were eliminated from this alternative to reduce impacts to streams and fisheries habitat. Other units were eliminated to avoid impacting old growth habitat or reducing connections among key habitat areas. Appendix E of the FEIS includes a table that displays the reason for the inclusion, exclusion, or modification of units in Alternative F as compared to the Proposed Action.

## **Rationale for the Decision**

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This section explains why I chose Alternative F to be the Selected Alternative.

### **NO ACTION: NOT AN OPTION**

I have decided that doing nothing in the Logan Creek Area is not an option given the current Douglas-fir bark beetle infestation, the accumulation of hazardous fuels in the area, and generally how far out of the range of historical conditions the forests are in this watershed. Contemporary forest science emphasizes the importance of creating and maintaining historical forest conditions under which the forest's flora and fauna evolved. Research shows that the Logan Creek Area has substantially deviated from historical conditions, and I have decided that action is needed to at least begin the process of returning the forest to these natural historical conditions.

I have particularly considered the following facts presented in the FEIS when I decided that action is needed in the Logan Creek Area.

**Douglas-fir is Over-Represented in the Logan Area and Many Acres are Infested with Bark Beetles.** All five hydrologic units in the Logan Creek Area currently have substantially more Douglas-fir cover type than the median or mean amount that historically occurred in those areas (FEIS p. 3-10 and Exhibit P-23). In fact, three of the five hydrologic units in the Logan Creek Area currently are at or above the historic maximum for the amount of Douglas-fir cover type. Of the 48,400 acres of National Forest System land in the Logan Creek Area, 30,689 acres were determined to have some level of hazard for Douglas-fir bark beetle; of these, 8000 acres are currently at moderate to high risk of beetle attack, which is approximately 18 percent of the Logan Creek Area (ROD Table 2, Need Indicator #3). Over the last four years, between 1000 and 2000 acres per year have become newly infested with Douglas-fir bark beetles (Exhibit P-1).

**Fire Suppression Over the Last 60 Years has Resulted in High Accumulation of Hazardous Fuels.** Before 1940 when fire suppression efforts became effective, a spreading wildland fire severe enough to change stand structure occurred approximately once every 8.5 years in the Logan Creek area (FEIS, p. 3-74). In reality, only one major fire has burned in the Logan area since 1940 (the Sanko Creek fire of 1940 with 3,000 acres in Logan Creek area) (FEIS, p. 3-73). Approximately half the Logan Creek Area (30,000 acres) is outside the range of historical conditions for fire regimes (FEIS, p. 3-71). Current fire frequencies have departed from historical frequencies by intervals of one or more fire cycles.

The greatest effect of fire suppression and exclusion in unison with other natural disturbance processes such as mortality from beetle infestations is that biomass has accumulated in most unmanaged timber stands. The combination of dead fuel and continuous live vegetation from the forest floor to the upper forest canopy has created a complex of fuel that, when ignited under severe fire conditions, would leave little or no surviving above-ground vegetation. Over half of the entire Logan Creek area (and a large percentage of unmanaged stands) has fuel conditions conducive to sustaining crown fires (approximately 34,500 acres are in Fuel Behavior Models 8/10 or 10, shown in FEIS Table 3-26 on p. 3-78). The entire Logan Creek Area is within the Intermix Community category of Wildland/Urban Interface, as defined by the National Fire Plan; structures are scattered throughout the entire Logan Creek area.

**Fire Suppression has Altered Natural Landscape Patterns.** Forest patch sizes are currently smaller than the average patch size that used to occur in the Logan Creek Area before fire suppression. An evaluation of patch size, which is the area of a particular forest successional stage left undisturbed, revealed that average patch size in the Logan Creek Area before fire suppression ranged from 100 to 600 acres (FEIS, p. 3-10), which is larger than current patch sizes, especially in the early seral (seedling/sapling stands) and mid-seral successional stages (pole-sized and mature forests). Natural fire in previous centuries is credited with creating the larger historical patch size than now occurs on the landscape. In fact, at any one point in time during the pre-fire-suppression era, the amount of area in an open, seedling stage of development could range from about 5 percent to up to 80 percent in any sub-watershed (FEIS, p. 3-10). Right now, the Logan hydrologic units have only 12 to 30 percent in the seedling stage. This notable disparity implies that the Logan Creek Area historically had more acres in the early successional stage and in larger patch sizes than now occur.

ROD Table 2. Response of Alternatives to Purpose and Need Objectives.

Need Indicators:	Alt. A <i>No Action</i>	Alt. B <i>Proposed Action</i>	Alt. C <i>Wildlife Security</i>	Alt. D <i>Old Growth and Connectivity</i>	Alt. E <i>Soil and Water</i>	Alt. F <i>Preferred Alternative</i>
<b>#1. Reduce Hazardous Fuel</b> - acres of fuel models 8, 8/10, or 10 converted to fuel models 2/5, 5, or modified 8 - total effectiveness rating - acres treated in condition class 2 for the mixed severity 2 and stand replacement fire regimes	0  11.93  0	7455  15.46  6784	5066  14.83  4579	5487  15.21  6584	7146  15.42  6584	6284  15.57  5853
<b>#2. Restore Vegetative Cover Types and Structure Classes</b> - total acres of regeneration harvest and commercial thinning - average patch size by seral stage • Mean patch size (acres) Late seral Mid-seral Early seral • Number of patches Late seral Mid-seral Early seral	0    426 119 80  71 104 232	6624    113 69 52  224 169 472	4235    186 81 51  149 146 426	4724    172 83 50  159 146 437	6315    153 81 45  169 144 528	5521    132 71 55  204 167 407
<b>#3. Reduce the Vulnerability of the Forest to Insect Infestation</b> - percentage of national forest land at moderate risk to Douglas-fir bark beetle - percentage of national forest land at high risk to Douglas-fir bark beetle	10%  8%	8%  4%	8%  5%	8%  5%	8%  4%	8%  4%
<b>#4. Provide Habitat for Wildlife Species</b> - acres of understory treatment in potential goshawk and/or flammulated owl habitat - acres burned in ungulate summer range to slow conifer encroachment - percent of elk analysis units comprising >30% elk hunting season security	0  0  57%	1251  647  29%	1403  647  100%	1472  647  29%	1343  647  29%	1515  647  86%
<b>#5. Improve Water Quality and Reduce Sediment</b> - number of stream crossings improved by BMPs or through road reclamation	0	122	93	110	122	114

Need Indicators:	Alt. A <i>No Action</i>	Alt. B <i>Proposed Action</i>	Alt. C <i>Wildlife Security</i>	Alt. D <i>Old Growth and Connectivity</i>	Alt. E <i>Soil and Water</i>	Alt. F <i>Preferred Alternative</i>
<b>#6. Improve Aquatic Habitat and Enhance Fisheries</b> - number of culverts improved to allow increased fish habitat conditions	0	8	6	8	8	8
<b>#7. Provide Economically Viable Removal of Timber</b> - million board feet of timber harvested	0	59	34	38	54	43

**Old Growth is at Risk from Douglas-fir Bark Beetle Infestation and Wildland Fire.** The habitat value of many old growth stands in the Logan Creek Area is currently deteriorating from insect or disease infestation and related mortality. About 17 percent of the National Forest System land in the Logan Creek Area is old growth habitat (FEIS Figure 3-9, p. 3-198). It is important to protect the integrity of old growth stands by taking action to reduce the risk of insect and disease attack as well as from wildland fire.

**Four Logan Sub-Watersheds are in Need of Watershed Improvements.** As was estimated from water yield computer modeling, four Logan Creek sub-watersheds—Bill, Cyclone, Pike, and Reid Creeks—have experienced increased channel erosion and increased peak flows in the past (FEIS, p. 3-123), most likely from timber harvest and accelerating mortality from beetle infestation. Moreover, past stream channel surveys showed some instability in segments of these four streams. Road rehabilitation and reclamation are needed, particularly in these four watersheds, and these procedures would not occur if the No-Action Alternative were chosen (FEIS, p. 3-136). If I chose to take no action, high fuel levels brought on partially through past fire suppression puts the Logan Creek area at risk of a severe, intense fire (FEIS, pp. 3-136 and 3-158). This would lead to temporary, negative effects on water quality by increasing overland flow and fine sediments routed to streams. A severe fire would be particularly devastating in the Sanko and Pike Creek drainages where small populations of native cutthroat trout still exist despite competition from brook trout (FEIS, p. 3-158).

## TAKING ACTION IS THE RIGHT REACTION

Current conditions in the Logan Creek Area can be returned to—or at least pointed in the direction of—historical conditions by applying appropriate management action. Without action, the risk of severe wildland fire increases, current bark beetle infestations would continue to spread, water quality concerns in four sub-drainages would continue, and fisheries and wildlife would remain vulnerable to the combined risks of continued insect and disease infestation and wildland fire.

I agree with the conclusion of the resource specialists who wrote the FEIS for the Logan Creek Ecosystem Restoration Project: we need to remove Douglas-fir trees infested with bark beetles and high-risk Douglas-fir that are likely to become infested in the near future. Also, the number and density of trees need to be reduced so a high-intensity crown fire cannot be

easily sustained. The amount of hazardous fuels on the ground needs to be reduced for the same reason. Preparing forests to be able to sustain frequent ground-fires, just as they did in centuries past, is an important goal to meet. Overstory trees used to be farther apart with fewer understory trees that act as “ladder fuels,” which lead a ground fire upwards to become a crown fire. A forest like this is capable of enduring frequent ground fires with minimal mortality to individual overstory trees. If we can help forests to return to these historical conditions, future wildfires would not burn as hot and would have beneficial effects on the forest ecosystem—not the devastating effects that would be incurred by an infrequent, severe fire.

The most cost-efficient method of meeting these purpose and need objectives, which are outlined in detail earlier in this document and in the FEIS (Chapter 1), involves commercial timber harvest. Trees that need to be removed from stands to either reduce tree densities or control a bark beetle infestation will be removed via commercial timber sales spread out over approximately a 5- to 7-year period. This is an important point: the Logan Creek project was not designed simply to provide wood for local mills. Instead, it was primarily designed to address ecological imbalances, and commercial timber sales are the most cost-efficient method of implementing the project and addressing these imbalances (FEIS, pp. 2-42 and 2-43). A beneficial spin-off to this project is that wood will be available for local mills to contribute to the local economy. As shown in ROD Table 2, Need Indicator #7, the Selected Alternative will generate approximately 43 million board feet of timber, which is in the mid-range of action alternative estimates.

Commercial timber sales associated with an action alternative would provide the funding and contractual framework for doing needed road rehabilitation, reclamation, reforestation, and other resource improvement projects, which include:

- Construction of five fish pools in the lower stretch of Logan Creek, which is deficient in this important trout habitat.
- Planting of shrubs in between 100 to 500 acres of newly harvested units in upland habitat where it will provide wildlife browse.
- Planting of shrubs and conifers in approximately 90 acres of riparian habitat in previously harvested areas.
- Placement of large woody debris in about 3.7 miles of streams to improve fish habitat.
- Replacement of eight culverts to remove fish migration barriers.

### **ACTION IS NEEDED, BUT WHICH ALTERNATIVE SHOULD I CHOOSE?**

The Proposed Action, Alternative B, was designed to best address the purpose and need objectives outlined above and in Chapter 1 of the FEIS. The other action alternatives (Alternatives C, D, E, and F) were designed to address the purpose and need to a large degree while also considering a variety of other resource concerns, as was described in detail in the above section about the alternatives. The features of the alternatives were summarized in Table 1 of this document. As you might expect, analysis in the FEIS revealed that Alternatives C, D, E, and F would not accomplish the purpose and need objectives quite as

well as the Proposed Action. This is displayed in ROD Table 2 (above), which is a quantitative comparison of how well the various alternatives address the Purpose and Need for action. However, each of the action alternatives would be far better at meeting objectives than the No-Action Alternative.

My challenge was to decide which action alternative to choose based on how well they would meet the purpose and need for action while considering the array of environmental effects they would cause on related resources. **I chose Alternative F because it presents the best balance between meeting purpose and need objectives and minimizing effects on other resources. Alternative F addresses the purpose and need objectives almost as well as the Proposed Action, but substantially decreases impacts on wildlife and other resources compared to the Proposed Action.**

The Selected Alternative will do the following:

- Be most effective of all the alternatives at reducing risk of wildland fire in the Logan Creek Analysis Area.
- Treat more acres of beetle infestation and reduce the potential for Douglas-fir beetle-caused mortality more than the other alternatives.
- More effectively maintain travel corridors than any of the other action alternatives and provide better elk habitat security during hunting season than most of the other action alternatives.
- Disturb old growth habitat less than the other action alternatives.
- Increase peak flows less than the Proposed Action and at a level essentially the same as the other action alternatives.
- Reclaim and rehabilitate roads that hydrologically benefit the Logan Creek Analysis Area the most of all the alternatives.

In the following paragraphs, I will refer to the FEIS to support my statement that the Selected Alternative best addresses the purpose and need for action while having fewer impacts than other action alternatives. I also relied on the Interdisciplinary Team's input about each unit, which is displayed in Appendix E of the FEIS. I also considered how well each alternative responds to the issues, which is FEIS Table 2-10 and is included at the end of this section as ROD Table 3.

**The Selected Alternative Involves Treatments that will Best Enable the Forest to Withstand Frequent Surface Fires.** Although the Selected Alternative will treat fewer acres than would Alternatives B or E (FEIS, Table 3-31, p. 3-93), the Total Effectiveness Rating of the Selected Alternative is higher than any of the other alternatives (FEIS, Table 3-37, p. 3-96). The reason why this apparent anomaly is true is because the Selected Alternative has much less precommercial thinning (only 310 acres) than Alternatives B, C, and E (3783 acres), and precommercial thinning generates short-term hazardous fuels. The highest Total Effectiveness Rating of the Selected Alternative indicates that Alternative F will be most effective of all the alternatives at reducing risk of wildland fire on a variety of resources in the Logan Creek Area.

All the action alternatives, as shown in Need Indicator #1 of ROD Table 2, focus primarily on treating timber stands that have been moderately altered from historical range of fire conditions (Condition Class Departure 2, described on page 3-71 of the FEIS). These are the stands in the Logan Creek area that are most out of alignment with historical natural fire regimes. By applying appropriate silvicultural prescriptions to these stands, we can re-create historical vegetative conditions that will enable these stands to withstand repeated low-intensity surface fires without the likelihood of “crowning out” and becoming severe wildland fires.

In fact, analysis in the FEIS has shown that even commercial thinning, which would leave the most trees per acre of any harvest prescription in the Selected Alternative (approximately 50 percent canopy cover), will be quite effective at reducing the likelihood of sustaining a crown fire. The Nexus Model is a fire behavior computer model that evaluates the likelihood of surface and crown fires before and after vegetation management (FEIS, pp. 3-86 to 3-87). It was used to estimate pre-and post-treatment fire behavior in commercial thinning Unit 47. In layman’s terms, results show that commercial thinning in this unit will cause tree crown height to be much higher, the amount of canopy biomass will be reduced by two-thirds, and the post-treatment forest will be unlikely to support a high-intensity wildland fire with sustained crown fire runs, group torching, firewhirls, and long-range spotting.

I am confident that the treatments proposed in the Selected Alternative will substantially reduce the risk of severe wildland fire in the Logan Creek Area. Where not enough live trees remain in a stand to do a commercial thinning (HDR), a regeneration harvest method was chosen such as a shelterwood (MDR) or seed tree harvest (LDR). These latter two harvest methods would retain even fewer trees per acre than a commercial thinning and therefore would be even less likely to sustain a crown fire. After any of these three treatments, between 5 and 23 tons per acre of large coarse woody debris would be retained (FEIS, p. 3-84). Research has shown that this is within the range expected to sustain only a surface fire, not a crown fire.

The Selected Alternative involves the following combination of harvest prescriptions: 1809 acres of Heavy Dispersed Retention; 3093 acres of Moderate Dispersed Retention; 523 acres of Light Dispersed Retention; and 96 acres of Heavy Aggregated Retention (FEIS, Table 3-9, p. 3-34) (Reminder: “Heavy” indicates the most trees retained on-site; “Light” indicates the fewest trees retained. Refer to FEIS, pp. 3-30 to 3-31 for details about retention levels).

Another feature common to all the action alternatives, including the Selected Alternative, is that all treatment areas (except Units 202 and 202.1) would be linked to previously treated stands or areas of natural fuel breaks (FEIS, p. 3-93). Therefore, implementation of the Selected Alternative will create more effective fuel reduction zones than would any one individual unit in the face of a large uncontrolled fire burning in adjacent untreated stands. As for the exception noted above, the underburning across 280 contiguous acres in Units 202 and 202.1 will create a fuel reduction zone in and of itself.

As was proposed by all action alternatives, the Selected Alternative will also feature use of prescribed fire without associated commercial timber harvest where not enough merchantable trees occur to sustain a timber sale. Spring season prescribed underburning will occur on a total of 566 acres within a total of 916 acres that have been identified as particularly suitable

for this type of treatment. In addition, 182 acres of fuels treatment will be accomplished without commercial timber harvesting or underburning. The work will be accomplished using hand tools and chain saws to move the material into piles and ultimately burn the piles.

**The Selected Alternative will Reduce the Potential for Douglas-fir Beetle-Caused Mortality.** The Selected Alternative will involve appropriate vegetation management that will reduce the current Douglas-fir bark beetle infestation in approximately 5050 at-risk acres. These acres are distributed among estimated risk categories from very low hazard to high hazard. The Selected Alternative will treat approximately 60 more acres at-risk of beetle infestation than the Proposed Action and up to 1578 more acres than Alternative C (FEIS, p. 3-43). The reason why the Selected Alternative will treat more acres of beetle infestation than the other alternatives is a combination of two factors:

- more specific targeting of at-risk acres for treatment.
- recent field surveys indicating new infestation in some Proposed Action units that previously appeared uninfested.

**The Selected Alternative will Redirect Landscape Patterns towards Historical Conditions.** Patch sizes are smaller now than they were in previous centuries, especially in the early seral/structural stage. Of all the action alternatives, the Selected Alternative will create the least number of early seral patches, the largest early-seral patch size, and reduce fragmentation in the early and mid-seral stages (FEIS, p. 3-46). All of these efforts will direct the current landscape towards historical conditions better than any of the other action alternatives, although it is very similar to the Proposed Action (ROD Table 2, Need Indicator #2).

**The Selected Alternative Minimizes Interruptions of Wildlife Connectivity.** Harvesting timber has the potential to sever forested travel corridors that enable wildlife to travel throughout the Logan Creek area through relatively undisturbed, secure forest cover. As analyzed by the district wildlife biologist, the Selected Alternative is substantially more effective at maintaining travel corridors than any of the other action alternatives (ROD Table 3, Issue Indicator #3). A number of units in the Proposed Action that would interrupt travel corridors were dropped altogether (126 acres were dropped for this reason alone; another 815 acres were dropped for this reason along with other reasons) (FEIS, Appendix E). Other Proposed Action units were changed from a Moderate Dispersed Retention prescription to a commercial thinning (Heavy Dispersed Retention) to retain more trees in the unit so it could function as travel corridors (a total of 656 acres were changed this way for this connectivity reason alone; another 251 acres were changed this way for this reason and others) (FEIS, Appendix E).

The Selected Alternative also offers better elk habitat security during hunting season than most of the other action alternatives (ROD Table 3, Issue Indicator #1).

**The Selected Alternative Minimizes Impacts on Lynx.** Alternative F, which is the Selected Alternative, was designed in part to reduce effects on Canada lynx. To reduce effects on sapling and mature lynx feeding habitat, the Selected Alternative will involve only 310 acres of precommercial thinning—all of which is outside of lynx habitat--instead of the 3783 acres in the Proposed Action, some of which would be in lynx habitat. The Selected Alternative is



consistent with the recommended standards and guidelines found in the Canada Lynx Conservation Assessment and Strategy (Lynx Biology Team 2000) (FEIS, pp. 3-294 and 3-295).

**The Selected Alternative Minimizes Impacts to Old Growth Habitat.** The Selected Alternative is consistent with Amendment 21 direction (Exhibit Q-13). Specifically, it involves the following features:

- **No harvest units will be located in old growth habitat.** The Selected Alternative does propose units that include 44 acres of old growth habitat whose quality appears to be deteriorating from beetle-related mortality; however, those units will not be harvested if they still qualify as old growth habitat at time of sale layout (FEIS, p. 3-212).
- **One acre of old growth will be harvested to build Road 18** to access Units 17 and 19A in the Logan Creek Area and several units in the Good Creek Drainage (Good Creek Resource Management Project Record of Decision; March 2000) (FEIS, p. 3-213). The roads were located to minimize impacts to old growth to the extent feasible (Exhibit Q-15). Units 17, 19A, and the Good Creek units are currently dead lodgepole pine, heavy with blowdown, and all high fuel hazards. By harvesting the acre of old growth along North Fork Evers Creek to build Road 18, the Selected Alternative will enable these units to be harvested in a timely manner and replanted with a mixture of desirable conifer species. This course of action will help regenerate these units and will lead to them becoming mature forests more quickly than leaving the dead lodgepole pine in its current condition and relying on natural processes. This will also help reduce water yields and peak flows in the Evers Creek sub-watershed area more quickly than if we take no action in these units. Also, the Selected Alternative will reduce the amount of hazardous fuel in this area, which will help protect old growth values in nearby stands.
- **0.1 acre of old growth will be harvested to relocate Road 2913** to address hydrologic concerns near Reid Creek. This will include reclamation of about 0.3 miles of road (System Road 2) that is currently within a narrow, isolated patch of old growth habitat. The new location will be mostly in the sapling and pole-sized stands north of the old growth. However, 100 to 150 feet of new road will be constructed within the old growth stand to connect the new road construction with the remaining segment of Road 2913 inside the old growth stand. The new portion of this road was also located to minimize impacts to old growth to the extent feasible (FEIS, p. 3-214, referring to p. 3-212).
- **No high-contrast edge will be created immediately adjacent to old growth habitat** (ROD Table 3, Issue Indicator #2 and FEIS, p. 3-213). No regeneration harvest would create new abrupt habitat edge on old growth habitat. A number of acres were dropped from the Proposed Action units to create Alternative F (the Selected Alternative) because they are adjacent to old growth habitat (168 acres were dropped solely because they are adjacent to old growth; 681 acres were also dropped for other reasons) (FEIS, Appendix E). In addition, the Proposed Action's prescription for 150 acres of one harvest unit was changed from Moderate Dispersed Retention to Heavy Dispersed Retention because it is adjacent to old growth habitat. An additional 0.8

miles of new seral/structural stage will be created across preexisting roads from old growth habitat. The roads have already imposed many edge effects (FEIS, p. 3-213). This type of disturbance to old growth is less than the Proposed Action and some of the other action alternatives. Tree planting and removal of dead and downed trees would accelerate redevelopment of future buffering habitat. All or many windfirm live trees and snags would be left, maintaining available current canopy cover and habitat features such as future nesting trees.

- **Old growth areas are prescribed for underburning.** Hand-slashing and underburning will occur in 127 acres of old growth habitat in Unit 200. These activities are expected to maintain and extend the duration of ponderosa pine and Douglas-fir old growth habitat characteristics. The underburning activity will be carefully conducted to minimize the risk of losing or reducing the quality of old growth habitat from the burning itself or from a subsequent insect infestation.

I have decided that harvesting 1.1 acres of old growth habitat to build two roads and that underburning 127 acres of old growth habitat are acceptable trade-offs for the ecosystem restoration benefits that implementing the Selected Alternative will provide the Logan Creek area. In addition, the project is consistent with management direction related to old growth forests (Exhibit Q-13).

**The Selected Alternative will Minimize Detrimental Soil Impacts from Harvesting.**

Actually, all action alternatives were designed to do this. Only one unit (101A) is located on a landtype that is rated as sensitive during spring and times of heavy precipitation (FEIS, p. 3-178 and 3-184). Unit 101A will be treated using the combination of treatments (skyline yarding and excavator site preparation) that would cause the least environmental impact of the array of treatments proposed by the action alternatives. New permanent and temporary roads all avoid sites with a high risk of mass failure (FEIS, p. 3-187). Five units in the Selected Alternative had previous management activity and were each individually examined to determine whether they are in a condition to be treated again, and they are (FEIS, p. 3-177 and 3-178). These units will receive special monitoring (Appendix C of this document).

**The Selected Alternative will Minimize Hydrological Impacts of Harvesting.** According to computer modeling, the Selected Alternative will create a smaller increase in peak flows than the Proposed Action in four hydrologically sensitive sub-watersheds (Reid, Pike, Cyclone, and Bill Creeks). The Selected Alternative will create essentially the same effects on these four sub-watersheds as would the other action alternatives (ROD Table 3). As analysis revealed, predicted peak flow increases in Reid, Pike, Bill, and Cyclone Creeks from all action alternatives would be within acceptable levels to avoid stream channel erosion and sedimentation (FEIS, p. 3-133 and 3-134).

A number of acres were dropped from the Proposed Action units to create Alternative F (the Selected Alternative) because they are in these hydrologically sensitive sub-drainages. In fact, 72 acres were dropped solely because they are in sensitive sub-drainages; 253 acres were dropped for a combination of this reason and others. In addition, 101 acres of MDR prescription in the Proposed Action was changed to an HDR prescription in part to retain more trees within units in hydrologically sensitive sub-drainages of Logan Creek (FEIS, Appendix E). The Selected Alternative will harvest primarily stands with a large proportion

of dead trees or trees at high risk of mortality from insects and disease. Subsequent reforestation of these stands with vigorously growing trees will help these sub-drainages recover hydrologically.

The Selected Alternative will involve 3.8 miles of new system road construction (0.6 miles less than the Proposed Action) and 4.5 miles of temporary road construction that will be obliterated after use (0.9 miles less than the Proposed Action). The greatest potential source of sedimentation is usually where new roads cross a perennial stream, but this will not occur with the Selected Alternative. Only one stream crossing will be made (where temporary road #3 accesses Unit 24), and this is an intermittent channel with no surface water connectivity to any other stream. No sedimentation will occur downstream from this crossing (FEIS, p. 3-163).

All units in the Selected Alternative are in upland areas away from streams except for Unit 138A, which is in the Riparian Habitat Conservation Area (RHCA). Unit 138A prescribes removal of fuel loading from an area 200 to 300 feet away from Logan Creek; the fisheries biologist attests that this treatment is beneficial and does not retard accomplishment of any management objectives (FEIS, p. 3-160 and 3-171).

**The Selected Alternative will Reclaim and Rehabilitate Roads that Hydrologically Benefit the Logan Creek Area the Most.** Alternative F (the Selected Alternative) shares a road reclamation and rehabilitation scheme with Alternative E, which was designed to maximize improvement to aquatic resources in the Logan Creek Area. The Selected Alternative will rehabilitate 133 miles of road, almost as much as the Proposed Action would have. Road rehabilitation will improve these roads to Best Management Practice standards, which will reduce sedimentation to streams (ROD Table 2, Need Indicator #5). The Selected Alternative will also reclaim 16.6 miles of system road, and the road segments chosen for reclamation were identified after considerable study for the particular benefit that they will provide. Because many roads chosen for reclamation in the Selected Alternative are either presently unusable for fire suppression or are redundant roads (i.e., other useable roads access the same area), the net reduction in fire suppression motorized access is only 1.0 miles—compared to 5.0 miles for Alternatives B, C, and D (FEIS, p. 3-97). The Selected Alternative's road reclamation and rehabilitation plan will produce great hydrological benefits with minimal reduction in motorized access for fire suppression. Another hydrological improvement involved with the Selected Alternative is relocation of a road away from the flood plain of Reid Creek and a culvert replacement there, both of which will improve stream conditions in that sub-drainage.

**The Selected Alternative Will Generally have Beneficial Effects on Recreational Uses of the Logan Area.** All action alternatives, including the Selected Alternative, involve features that would affect trail users. An additional 2000 feet of new trail will be constructed to lengthen the existing Tally Overlook Trail (#804) to make it a loop trail from the Tally Lake Campground instead of an out-and-back trail. Another effect of the Selected Alternative is that six units will be harvested immediately adjacent to two trails (one unit next to Trail #163 and five units next to Trail #800). Although this harvesting may cause short-term trail closures, in the long term this harvesting will provide foreground visual diversity and long-distance viewing. I consider both the new trail construction and harvesting adjacent to trails to be acceptable—even desirable—effects.

Another feature of the Selected Alternative that will affect trail users is the seasonal trail closure that will prohibit motorized travel during big-game hunting season on a 12.7-mile portion of the Tally Mountain Trail #800. This will improve elk security in this area without unduly inconveniencing hunters. Because this is a single-track trail on steep terrain that often gets snowed-in early, hunters would be unlikely to choose to hunt from a motorbike on this trail anyway.

Some road-related features of the Selected Alternative will benefit members of the public who like to drive forest roads, but others will not. Approximately 133 miles of system road will be rehabilitated, which means that road surfaces will be made smoother and drainages features improved. This will add to public safety and enjoyment while driving these roads. On the other hand, about 1.3 miles of road that is currently open to the public will be reclaimed and unavailable for recreational motorized access.

The Selected Alternative also involves a change in road status from open year-long to closed year-long on 6.2 miles of road for wildlife security reasons, which is the most mileage of any of the alternatives. The choice of specific road segments was made to avoid limiting motorized access to trailheads and campgrounds. Also, snowmobiles would continue to be allowed on these roads between December 1 to either April 1 or May 15, depending on location. I consider the loss of motorized access on these 7.5 miles of road (1.3 miles of reclaimed road and 6.2 miles of gated road) to be an appropriate trade-off for an improvement in wildlife security and water quality (ROD Table 3, Issue Indicator #6).

The analysis supporting my decision took a hard look at the effects of logging and road construction on the unique values of unroaded lands within the Logan Creek area. I have fully considered these effects as disclosed in the Recreation Section of the FEIS and Exhibit L-2 and thoroughly examined the impact of the Selected Alternative on the potential for the unroaded areas to be designated as Inventoried Roadless Areas or wilderness in the future.

**ROD Table 3. Response of Alternatives to Issues.**

<b>Issue and Issue Indicators:</b>	<b>Alt. A <i>No Action</i></b>	<b>Alt. B <i>Proposed Action</i></b>	<b>Alt. C <i>Wildlife Security</i></b>	<b>Alt. D <i>Old Growth and Connectivity</i></b>	<b>Alt. E <i>Soil and Water</i></b>	<b>Alt. F <i>Preferred Alternative</i></b>
<b>#1. Wildlife Security</b>						
• Percent of analysis area in elk hunting season security area	33.2%	35.0%	42.3%	35.4%	34.2%	38.6%
• Percent of elk habitat analysis units with < 30% in elk hunting season security area	43%	71%	0%	71%	71%	14%
• Acres unavailable to elk (> 600' from cover)	129	827	438	549	792	681
• Miles/sq. mile of roads open year-round	0.99	0.91	0.91	0.91	0.91	0.91
• Miles/sq. mile of roads open in summer	1.34	1.27	1.26	1.34	1.26	1.26
• Vulnerability to habitat loss via firewood cutting in acres	3706	3016	3100	3173	3065	3016

Issue and Issue Indicators:	Alt. A <i>No Action</i>	Alt. B <i>Proposed Action</i>	Alt. C <i>Wildlife Security</i>	Alt. D <i>Old Growth and Connectivity</i>	Alt. E <i>Soil and Water</i>	Alt. F <i>Preferred Alternative</i>
<b>#2. Old Growth Habitat</b>						
• Acres of harvest in “possible” old growth habitat (would occur only if no longer old growth at time of sale prep)	0	261	118	251	239	251
• Acres (and %) reduction of late seral/structural forest	0	4928 (16%)	2637 (9%)	2892 (10%)	4410 (15%)	4063 (13%)
• Miles (and acres) of new high contrast edge along existing old growth habitat	0 (0 ac)	11.7 (427 ac)	3.6 (129 ac)	0.0 (0 ac)	9.8 (356 ac)	0.0 (0 ac)
• Feet of new road through existing old growth habitat (and acres of old growth harvested assuming 4 acres harvested per mile of road)	0 (0)	1300’ (1.0 acres)	0 (0)	0 (0)	1450’ (1.1 acres)	1450’ (1.1 acres)
<b>#3. Landscape Patterns - connectivity</b>						
• Total of major forested connections severed	0	30	16	11	29	2
• Number of severed connections along ridgelines	0	5	0	3	5	0
• Number of forested riparian connections narrowed to less than 300 feet	0	3	1	1	3	0
<b>#4. Landscape Patterns - structural patch size and shape</b>						
• Mean patch size (acres)						
Late seral	426	113	186	172	153	132
Mid-seral	119	69	81	83	81	71
Early seral	80	52	51	50	45	55
• Number of patches						
Late seral	71	224	149	159	169	204
Mid-seral	104	169	146	146	144	167
Early seral	232	472	426	437	528	407
<b>#5. Water Quality &amp; Quantity</b>						
<i>Reid Creek</i>						
• % of area past and proposed harvest	39%	63%	61%	56%	61%	61%
• Miles of road / square mile	3.6	3.3	3.3	3.3	3.4	3.4
• Predicted peak flow increases	none	7%	5%	4%	5%	5%
<i>Pike Creek</i>						
• % of area past and proposed harvest	35%	47%	35%	45%	43%	44%
• Miles of road / square mile	3.6	3.1	3.1	3.1	2.8	2.8
• Predicted peak flow increases	none	5 %	0%	4%	4%	4%

<b>Issue and Issue Indicators:</b>	<b>Alt. A <i>No Action</i></b>	<b>Alt. B <i>Proposed Action</i></b>	<b>Alt. C <i>Wildlife Security</i></b>	<b>Alt. D <i>Old Growth and Connectivity</i></b>	<b>Alt. E <i>Soil and Water</i></b>	<b>Alt. F <i>Preferred Alternative</i></b>
<i>Bill Creek</i>						
• % of area past and proposed harvest	44%	59%	59%	59%	56%	57%
• Miles of road / square mile	4.1	4.1	4.1	4.1	4.1	4.1
• Predicted peak flow increases	none	5%	5%	4%	4%	4%
<i>Cyclone Creek</i>						
• % of area past and proposed harvest	56%	68%	58%	62%	64%	64%
• Miles of road / square mile	5.1	4.9	4.7	4.7	4.3	4.3
• Predicted peak flow increases	none	3%	0%	1%	1%	1%
<b>#6. Motorized Access</b>						
• Net change in miles of road available for recreational access year-round	0	- 6.9	- 6.9	- 6.9	- 7.5	- 7.5
• Net change in miles of road available for recreational access seasonally (July 1 to August 30)	0	0	- 0.7	0	0	0
• Net change in miles of road available for management and fire suppression activities	0	- 0.6	- 2.3	- 2.3	+ 3.4	+ 3.4
• Percent of drivable roads that are open to public motorized use	48.8%	48.3%	48.7%	48.7%	48.0%	48.2%

## Findings Required by Laws, Regulations, and Policies

Numerous laws, regulations, and agency directives require that my decision be consistent with their provisions. I have determined that my decision is consistent with the laws, regulations, and agency policies related to this project. The following summarizes findings required by major environmental laws.

### A. National Forest Management Act (16USC 1600 et seq.)

#### Consistency with Forest Plan Standards, Goals, and Objectives

The Flathead National Forest Land and Resource Management Plan of 1986 (Forest Plan) establishes management direction for the Flathead National Forest. This management

direction is achieved through the establishment of Forest-wide goals and objectives, standards, and guidelines. Additional goals and accompanying standards and guidelines have been established for specific Management Areas across the Forest. Project implementation consistent with this direction is the process in which desired conditions described by the Forest Plan are achieved. The National Forest Management Act requires that all project-level resource plans, such as this ROD, are to be consistent with the Forest Plan (16 USC 1604(i)). The FEIS displays the Forest Plan and Management Area goals and objectives and the standards and guidelines applicable to the Logan Creek Ecosystem Restoration Project area (FEIS, Appendix B). The alternative development process is detailed in Chapter 2 of the FEIS and in the Project File, while the management goals of the alternatives and the environmental consequences of the alternatives in relation to the Forest Plan standards and guidelines are described in Chapter 3 of the FEIS. After reviewing the FEIS, I find that my decision is consistent with Forest Plan standards, goals, and objectives as amended.

**Project-Specific Amendments to the Forest Plan.** The Forest Plan states on page II-20, “A project-specific amendment of a Forest Plan standard may be undertaken if it is demonstrated during project analysis that it will fulfill the objective of the standard and related goals.” With this decision, I am approving three project-specific amendments to the Forest Plan related to management area direction.

*Project-Specific Amendment of a Management Area 13 Standard.* This will temporarily amend an MA 13 standard (Timber Standard #2 for MA 13, Forest Plan page III-63) to allow timber harvest in Units 41A and 133 without harvest being specified in a Long Range Mule Deer and Elk Winter Range Activity Schedule. The Forest Plan has delineated a small area of MA 13 east of Star Meadow; this is the only MA 13 within the entire Logan Creek Area. It is located in T 20 N, R 24 W, Section 15. (Refer to FEIS Appendix B for a map of MAs in the Logan Creek Area.)

The reason why a site-specific amendment is warranted is because this small area of MA 13 does not function as big game winter range because snow is typically too deep. Other areas not designated as MA 13 in the Logan Creek area function as higher quality big game winter range. This temporary project-specific amendment will eliminate the requirement for a harvest activity schedule in Units 41A and 133 from the date this Record of Decision is signed until timber harvest is completed in these two units.

*Project-Specific Amendment of a Management Area 13A Standard.* This will temporarily amend an MA 13A standard (Timber Standard #1 for MA 13A, Forest Plan page III-64) to allow timber harvest in Units 51 and 52. The Forest Plan has delineated two small areas of MA 13A east of Star Meadow; this is the only MA 13A within the entire Logan Creek Area. It is located in T 20 N, R 24 W, Section 22. (Refer to FEIS Appendix B for a map of MAs in the Logan Creek Analysis Area.) Without a project-specific amendment of the Forest Plan, no timber harvest would be allowed in portions of Units 51 and 52.

The reason why a site-specific amendment is warranted is because these two small areas of MA 13A do not function as big game winter range because snow is typically too deep. Other areas not designated as MA 13A in the Logan Creek area function as higher quality big game winter range. This temporary project-specific amendment will temporarily allow timber

harvest in Units 51 and 52 from the date this Record of Decision is signed until harvest is completed in this unit.

*Project-Specific Amendment of a Management Area 2C Standard.* This will temporarily amend an MA 2C standard (Roads Standard #1 for MA 13A, Forest Plan page III-64) to allow construction of Temporary Roads 13 and 18, which are wholly or partially located on MA 2C. Temporary road 13 accesses Units 99, 99A, 100, and 100A and is located in T 29 N, R 24 W, Section 2. Temporary Road 18 accesses Units 137 and 137A and is located in T 29 N, R 24 W, Section 9. These two roads will subsequently be obliterated after timber harvest operations are complete. The Forest Plan designated Management Area 2C for emphasizing roaded, natural-appearing dispersed recreation opportunities, and the Forest Plan allows no new road construction in MA 2C.

The reason why a site-specific amendment is warranted is because recreation opportunities will not be compromised by this activity and actually may be enhanced by providing better viewing vistas along a heavily wooded trail system. These temporary roads will also enable salvage to occur, which complies with Timber Standard #1 for MA 2C (Forest Plan page III-9) when recreation values can be protected or enhanced. This temporary project-specific amendment will allow Temporary Roads 13 and 18 to be built from the date this Record of Decision is signed until both timber harvest and roadbuilding activities are completed.

**Finding of Nonsignificant Amendment.** The FSH 1909.12, Land and Resource Management Planning Handbook, 5.32, process to amend the Forest Plan, identifies the following four factors to consider in determining whether a change to the Forest Plan is significant or non-significant, based on NFMA planning requirements: 1) timing, 2) location and size, 3) goals, objectives, and output, and 4) management prescription. The following paragraphs document how these factors are considered for the proposed amendment.

**1) Timing.** These project-specific amendments will be short-term in nature and will be completed before the revision of the current Forest Plan. It is anticipated the current MA 13 and 13A areas in the vicinity of Oettiker Creek will be relocated in the revised Forest Plan. The Flathead Forest Plan revision is currently underway, with a decision anticipated in 2006 or 2007.

**2) Location and Size.** These project-specific amendments apply to specific management area locations in the Logan Creek drainage. This ROD affects only two acres of temporary road construction out of the 8934 acres of MA 2C on the Flathead National Forest and 1994 acres in the Logan Creek area. This ROD also affects land mapped as MA 13 and 13A; however, vegetation treatment in these areas does not affect elk and mule deer winter range because the vegetation and snow depth conditions do not allow for these areas to function as winter range.

**3) Goals, Objectives, and Outputs.** The overall goal of the standards for MA 13 and MA 13A is to provide winter range habitat for elk and mule deer. This goal will not change with these first two amendments because the areas affected are not providing winter range habitat due to typically deep snow conditions. The overall goal of the standards for MA 2C is to provide roaded, natural-appearing recreation opportunities.



This goal will not change with the last amendment because the two temporary roads will be obliterated after their use and will appear natural soon after operations are complete.

The changes described for these three amendments will not alter the long-term relationships between the levels of goods and services projected by the Forest Plan for the reasons stated in the preceding paragraph. The changes described for these short-term amendments specific to this project do not trigger an increase or decrease in outputs for other goods or services described in the Forest Plan. These amendments do not forego the opportunity to achieve outputs in later years.

**4) Management Prescription.** This modification is only for the MA 13 and 13A areas in the vicinity of Oettiker Creek and the MA 2C in the vicinity of Bill Creek and Upper Logan Creek; it does not apply to other areas on the Flathead National Forest. The modification is also only for the decisions made in this document and not for any future decisions made in this area.

The anticipated goods and services to be produced for the MA 13 and 13A areas are not altered because the areas are not functioning as elk and mule deer winter range. The anticipated goods and services for the MA2C are not altered because the roads will be obliterated following their use.

*Determination:* Based on a review of the four factors above, I considered the project-specific amendments to be non-significant and the amendments may be implemented for this project.

### **Suitability for Timber Harvest**

The Selected Alternative includes timber harvest on lands allocated to MA 2C (roaded, natural-appearing recreation areas) and MA 13A (non-forest mule deer/elk winter range) in the Forest Plan. These lands are classified as not suitable for timber production. However, salvage harvest on MA 2C land is consistent with management area direction stated in the Forest Plan (page III-9) and with 36 CFR 219.28(c). Rationale for the project-specific forest plan amendment to allow timber harvest on MA 13A lands is presented above. All other timber harvest authorized by this decision is located on lands deemed to be suitable for timber production in the Forest Plan.

Analysis of current and historical conifer regeneration data for the analysis area supports the conclusion that adequate stocking of trees for the proposed harvest units is assured (Exhibit P-22). Planting will be implemented over an estimated 2155 acres. Monitoring of regeneration will ensure that reforestation progresses at a desirable rate.

### **Clearcutting and Even-aged Management**

When timber is to be harvested using an even-aged management system, a determination that the system is appropriate to meet the objectives and requirements of the Forest Plan must be made and, where clearcutting is to be used, must be determined to be the optimum method (16 USC 1604(g)(3)(F)(i)). The clearcutting management system is not a component of the Selected Alternative. Even-aged management systems such as the seed-tree or shelterwood system are a part of the Selected Alternative.

*Determination that even-aged management systems are appropriate to meet the objectives and requirements of the Forest Plan:* Desired stand and landscape conditions were developed using Forest Plan goals and objectives as well as input from the public and contemporary concepts in sustaining forest and aquatic ecosystems. Timber stands within the area have evolved within a fire-dependent ecosystem. Within the Logan Creek area, Forest Plan objectives and requirements related to vegetation management are most clearly achieved through the use of even-aged management systems and, on some sites, through the use of intermediate systems.

It is my determination that proper use of even-aged systems and extensive application of long-term reserve tree concepts on appropriate sites can provide healthy, functioning ecosystems while providing a sustainable production of forest resources.

I have determined that the silvicultural systems in the Selected Alternative are appropriate to meet the objectives and requirements of the Forest Plan. The effects of implementing these harvest methods are described in the Vegetation section of the FEIS in the discussion of “light retention” and “moderate retention.” Exhibit P contains further documentation of the silvicultural diagnosis process and analysis.

### **Vegetative Manipulation**

All proposals involving vegetative manipulation of tree cover for any purpose must comply with the seven requirements found in 36 CFR 219.27(b).

1. Management prescriptions shall be best suited to the multiple-use goals established for the area with impacts considered in the determination.

- All proposed treatments meet a portion of the goals and objectives in the Flathead Forest Plan for designated Management Areas and meet the purpose and need for action.

2. Management prescriptions shall ensure that the lands can be adequately restocked with trees as provided in 36 CFR 219.27(c)(3) “...assure that the technology and knowledge exist to adequately restock the lands within five years after final harvest” (16 USC 1604(g) (E)(ii)).

- Adequate stocking of the units after harvesting will be provided through natural regeneration or planting of tree seedlings. Previous harvest units in the vicinity of the proposed treatment areas have all regenerated adequately through similar methods. There are no unusual site conditions within the units that lead me to believe that adequate regeneration will not occur on these sites as well.

3. Management prescriptions shall not be chosen primarily because they would give the greatest dollar return or the greatest output of timber.

- The Chapter 3 Socio-Economics section in the Logan Creek Ecosystem Restoration Project FEIS describes the economic effects by alternative.

4. Management prescriptions shall consider the effects on residual trees and adjacent stands.

- Management prescriptions were chosen primarily because they will result in desired environmental and social effects, as defined by the Purpose and Need for Action and Key Issues in the FEIS.
- The analysis considered the effects of management activities and practices on residual trees and adjacent stands as shown in Chapter 3 of the FEIS and Exhibits O, P, Q, and R. I find the selected stand treatment methods and the design criteria as listed in Appendix B of this decision document are adequate to protect reserve trees and adjacent stands in the vicinity of timber harvest, prescribed burning, and hand fuel reduction areas.

5. Management prescriptions shall avoid permanent impairment of site productivity and ensure conservation of soil and water resources.

- The effects of Alternative 3 on soil and water resources are disclosed in Chapter 3 of the FEIS. I find the thinning unit locations, silvicultural systems, riparian protection, logging technology, and post harvest activities, in relationship with the soil and water conservation practices planned, will minimize impairment of site productivity and ensure conservation of soil and water resources. The Best Management Practices (BMPs) to be followed in the project are identified in Appendix C of the FEIS.

6. Management prescriptions shall provide the desired effect on water quantity and quality, wildlife and fish habitat, regeneration of desired tree species, forage production, recreation use, and aesthetic values.

- Desired resource conditions for the project area are described in the landscape assessment completed in September 2001 and titled “*Logan Geographic Unit: Summary of Findings from the Ecosystem Assessment at the Watershed Scale*” (Exhibit A-1). Other desired conditions are provided in the Forest Plan. Environmental effects are described in Chapter 3 of the FEIS. Alternative F, the Selected Alternative, will have the desired effects on the resources stated above. The design criteria for the Selected Alternative are presented in Appendix B of this Record of Decision and will provide an additional measure of assurance that the above resources will be protected.
- The Selected Alternative complies with the Clean Water Act, Clean Air Act, Endangered Species Act, and with the Flathead Forest Plan, as amended.

7. Management prescriptions shall be practical in terms of transportation and harvesting requirements, and total cost of sale preparation, logging, and administration.

- The specified transportation and harvesting systems to be used in the implementation of this decision have been analyzed in combination with the other requirements of the management prescriptions. Equipment and technology that are commonly available are prescribed. The preparation, logging, and administration are practical for achieving the resource objectives and progress toward the desired future condition in the project area. A summary of the economic analysis included in the FEIS in the Socio-Economics Section of Chapter 3 along with its supporting documentation in the Project File demonstrates this finding.

### **Sensitive Species**

Federal law and direction applicable to sensitive species include the National Forest Management Act and the Forest Service Manual (2670). The Regional Forester has approved the sensitive species list, which identifies those plants, fish, and animals for which population viability is a concern. In making my decision, I have reviewed the analysis and projected effects on all sensitive species listed as possibly occurring on the Flathead National Forest (Biological Evaluations found in the Sensitive Plant, Fisheries, and Wildlife Sections of the Project File). The determination for cutthroat trout is “may impact individuals or habitat, but will not likely result in a trend towards federal listing or reduced viability for the population or species.” The determinations for sensitive wildlife and plants are either “no impact” or “may impact individuals or habitat but will not likely result in a trend toward federal listing or reduced viability for the population or species.” See Table 3-97 of the FEIS and Exhibit P-24 for a species by species listing. I concur with the findings documented for these species.

### **Necessity of Roads**

NFMA requires that the necessity for roads be documented and that road construction be designed to “standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources” [36 CFR 219.27(10)]. NFMA also requires that “all roads are planned and designed to re-establish vegetation cover on the disturbed areas within a reasonable period of time, not to exceed 10 years ... unless the road is determined necessary as a permanent addition to the National Forest Transportation System” [36 CFR 219.27(11)].

I have decided to reclaim 16.6 miles of road, construct 3.8 miles of system road, and construct 4.5 miles of temporary road. Reclamation of the 16.6 miles was determined to be desirable because a road-by-road analysis showed that nearly all roads proposed for reclamation (15.6 miles of 16.6 miles planned for reclamation) are not necessary for future management options or fire suppression (Project File O-12). The remaining one mile of road that will be reclaimed has particularly poor drainage. It delivers sediment to nearby streams, but currently provides fire suppression access. It will be reclaimed because the benefits of improving water drainage on this road exceed the small amount of fire access lost. Temporary roads will be reclaimed after use and will be revegetated within 10 years. The 3.8 miles of system road construction was determined necessary from landscape-level transportation planning that considered future management access needs (permanent files in the Flathead National Forest Supervisor’s Office). Based on these actions and analyses, I believe we have met the intent of the NFMA road requirements.

### **NFMA Viability**

The Forest Plan contains an array of components that contribute to the wildlife/fisheries habitat capability of the Flathead National Forest. Each of these components reduces the risk to wildlife and fish viability. Based upon a consideration of these components of the Forest Plan, as amended, monitoring and design criteria of the Selected Alternative, as well as an analysis of effects of the Logan Creek Ecosystem Restoration Project at the Forest and Regional Scale (Exhibits Rg-1 and F-10), I concluded that my decision poses little risk to the viability and distribution of native species. A further discussion of the habitat capability of

native species is presented below in Section F, The Endangered Species Act.

## **B. Clean Water Act and Montana State Water Quality Standards**

Upon review of the Logan Creek FEIS (Chapters 2 and 3, Appendix C: Best Management Practices, and Appendix D: Water Regulations), I find that the analysis took a hard look at the impacts of the project on water quality. The Interdisciplinary Team fully analyzed the impacts on water bodies by calculating the effects attributable to the activities, compared them among alternatives, and discussed the impact on water quality and fisheries.

All activities associated with the Selected Alternative will fully comply with the Clean Water Act by employing Best Management Practices and associated monitoring that meet or exceed reasonable land, soil, and water conservation measures. The Selected Alternative further complies with the Clean Water Act in meeting state water quality standards and complying with the antidegradation requirement by maintaining beneficial uses. The Montana Department of Environmental Quality has classified the drainages in the Decision Area in the B-1 category. Beneficial uses under this B-1 classification include: drinking, culinary, and food processing after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply. These beneficial uses in the Logan Creek Area will be protected as a result of the application of general and site-specific BMPs as well as other protective design features. Specific practices are described in detail in Appendices C and D of the FEIS.

## **C. Clean Air Act**

Upon review of the FEIS (Chapter 3), I find that the selected activities in my decision will be coordinated to meet the requirements of the State Implementation Plans, Smoke Management Plan, and Federal air quality requirements.

## **D. National Historic Preservation Act, American Indian Religious Freedom Act, and Native American Graves Protection and Repatriation Act**

Cultural resource reviews have been completed on all areas to be impacted by ground-disturbing activities. No cultural resources are expected to be affected by this action. Recognizing that the potential exists for unidentified sites to be encountered or disturbed during project activity, special provisions for their protection will be included in all contracts used to implement this project. These provisions will allow the Forest Service to unilaterally modify or cancel a contract to protect cultural resources, regardless of when they are identified. This provision will be used if a site were discovered after a harvest operation had begun. This project is in compliance with the Region 1 programmatic agreement (1995) with the State Historic Preservation Office and the Advisory Council on Historic Preservation.

## **E. Government-to-Government Relations**

The Forest Service consulted the Confederated Salish and Kootenai Tribes during the analysis process. The intent of this consultation was to remain informed about Tribal concerns regarding the American Indian Religious Freedom Act (AIRFA) and other tribal issues. In addition, the Salish and Kootenai Tribes reserved rights under the Hellgate Treaty of 1855. These rights include the "right of taking fish at all usual and accustomed places, in common with citizens of the Territory, and of erecting temporary buildings for curing; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." The federal government has trust responsibilities to Tribes under a government-to-government relationship to ensure that the Tribes reserved rights are protected. Consultation with the tribes during project planning helps ensure that these trust responsibilities are met.

## **F. The Endangered Species Act (16 USC 1531 et. seq.)**

In accordance with Section 7(c) of the Endangered Species Act, as amended, a list of the listed and proposed Threatened or Endangered species that may be present in the Logan Creek Area was obtained from the U.S. Fish and Wildlife Service. As required by the Act, Biological Assessments were prepared addressing the potential impacts to grizzly bear, gray wolf, bald eagle, Canada lynx, bull trout, water howellia, and Spalding's catchfly (Exhibits Rt-17, F-2, and P-24). The analyses concluded that this project may affect but is not likely to adversely affect the grizzly bear, gray wolf, bald eagle, Canada lynx, and bull trout, and that it would have no effect on the water howellia or the Spaulding's catchfly.

I requested formal consultation with the U.S. Fish and Wildlife Service (USFWS), due to discussions with them about grizzly bears outside the recovery area. In addition, the USFWS could not concur with our finding that the project "may affect but is not likely to adversely affect" for the Canada lynx, since critical habitat has not yet been designated for this species. After review of the Biological Assessment, the USFWS concluded that the project would not jeopardize the continued existence of the grizzly bear or Canada lynx populations (Exhibit Rt-21). No terms and conditions were provided in the Biological Opinion beyond the Design Criteria already incorporated into the Selected Alternative (refer to Appendix B of this ROD). The USFWS issued an Incidental Take Statement for grizzly bears in their Biological Opinion (Exhibit Rt-21).

The U.S. Fish and Wildlife Service concurred with our determination that the project would have "no effect" on the threatened water howellia or threatened Spaulding's catchfly. The Service also concurred with our determination that the project "may affect but is not likely to adversely affect" the threatened gray wolf, bald eagle, or bull trout (Exhibits Rt-21 and F-14).

Under provisions of this Act, Federal agencies are directed to seek to conserve endangered and threatened species and to ensure that actions are not likely to jeopardize the continued existence of any of these species. Upon review of the Logan Creek FEIS Chapter 3, the Biological Assessments, documentation of concurrence with the U.S. Fish and Wildlife

Service, and the Biological Opinion from the U.S. Fish and Wildlife Service, I find that Alternative F complies with this Act.

## **G. Migratory Bird Treaty Act**

On January 10, 2001, President Clinton signed an Executive Order outlining responsibilities of federal agencies to protect migratory birds. Upon review of the information regarding neotropical migratory birds in the FEIS and the Project File (Exhibits Rn-1 and Rn-2), I find that no significant loss of migratory bird habitat is expected from the implementation of the Selected Alternative.

## **H. Environmental Justice**

The Selected Alternative was assessed to determine whether it would disproportionately impact minority or low-income populations, in accordance with Executive Order 12898 (FEIS, Socio-Economics Section, Chapter 3). No impacts to minority or low-income populations were identified during scoping or effects assessment.

Compliance with other laws, regulations, and policies are listed in various sections of the FEIS, the Project File, and the Forest Plan.

## **I. Environmentally Preferred Alternative**

The FEIS analyzed one no-action and five action alternatives in detail. It is also required by law that one or more of those alternatives be identified in the Record of Decision as the environmentally preferred alternative(s). The environmentally preferable alternative is not necessarily the alternative that will be implemented and it does not have to meet the underlying need of the project. It does, however, have to cause the least damage to the biological and physical environment and best protect, preserve, and enhance historical cultural, and natural resources (Section 101 NEPA: 40 CFR 1505.2(b)).

Alternative A has been identified as the environmentally preferred alternative for the short-term. Alternative A would cause the fewest short-term adverse effects to water quality, aquatic habitat, and terrestrial wildlife habitat as a result of no timber harvesting, no road building, nor other ground-disturbing projects. On the other hand, all of the action alternatives have varying levels of environmental effects depending on the emphasis of the alternative, but any of them would cause fewer long-term adverse effects to water quality, aquatic habitat, and terrestrial wildlife habitat than would Alternative A.

Specifically, Alternative F offers the best balance between meeting the purpose and need for action and presenting the fewest long-term adverse environmental effects. I chose to implement Alternative F over Alternative A because the latter alternative does not address the risk of continuing and expanding beetle infestations, increasing hazardous fuel accumulations,

and continuing sedimentation from unimproved road drainage features as well as Alternative F, the Selected Alternative.

## Review Opportunities

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This decision is subject to appeal pursuant to 36 CFR 215.7. As stated in 36 CFR 215.11, an appeal may be filed by any person or non-Federal organization (Federal Agencies may not appeal). A written appeal must be submitted within 45 days after the date of the notice of this decision is published in *The Daily Inter Lake*, Kalispell, Montana. Appeals must be submitted to:

USDA Forest Service, Northern Region  
ATTN: Appeals Deciding Officer  
P.O. Box 7669  
Missoula, MT 59807

Appeals must meet the content requirements of 36 CFR 215.14. Detailed records of the environmental analysis are available for public review at the Tally Lake Ranger Station, 1335 Highway 93 W, Whitefish, MT 59937.

## Contact Person

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For further information on this decision, contact Bryan Donner, Project Leader, Tally Lake Ranger District (406-863-5408).

If no appeal is received, implementation of this decision may occur on, but not before, five business days from the close of the appeal filing period. If an appeal is received, implementation may not occur for 15 days following the date of appeal disposition.

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**CATHY BARBOULETOS**  
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**Date**



## **APPENDIX A: DETAILS of the SELECTED ALTERNATIVE**

As stated earlier in this document, I have decided to implement Alternative F of the FEIS and refer to it as the Selected Alternative. I will now describe this alternative in relation to Timing of Activities, Vegetation Management, Transportation Management, Fisheries Habitat Improvement, Wildlife Habitat Improvement, Design Criteria, and Project Monitoring.

### **Timing of Activities**

Forest products from the proposed harvest units will be offered in four large sale packages between fiscal years 2004 and 2007. Smaller sales may be offered between fiscal years 2005 and 2008. Completion of harvest activities will be expected within three to five years after any given sale contract is awarded. Site preparation, reforestation, wildlife habitat improvement projects, fisheries habitat improvement projects, and all other projects will be completed as soon as possible and no more than five years after logging is completed. Road reclamation will be completed within five years of the date a decision is made, and road closures for wildlife security purposes will be completed within two years of the decision date. A map showing the implementation schedule is in Project File Exhibit E-1.

### **Vegetation Management**

The Selected Alternative will apply several different vegetation treatments over about 6600 acres within the Logan Creek area. Please refer to the Vegetation Treatment Map (Figure A-1). These treatments include approximately:

- 5521 acres of commercial timber harvest, which includes salvage harvest. Harvest activities will occur in 126 different units within the project area as listed in Table A-1. This table contains a column of Map Grid coordinates that relate to numbers and letters on the sides of Figure A-1, which allows for easy location of units on the vegetation treatment map. Openings will be created using a combination of shelterwood and seed tree harvest methods, followed by prescribed burning or excavator site preparation for seedling regeneration. Reserve trees will be left both in clumps and as individual trees. Some units will instead be commercially thinned, leaving the remaining trees dispersed across the stand.
- 566 acres of spring season prescribed underburning of brush fields, forest understory, and other forest vegetation. Some slashing or other pretreatment of forest vegetation may be necessary. This burning will reduce fuel levels, improve habitat for wildlife, and return the forest structure of these areas closer to historical conditions.
- 182 acres of fuels treatment without commercial timber harvest or underburning. This treatment will reduce fuel levels and return the forest structure of these areas closer to historical conditions. Vegetative materials to be piled and burned are brush and small-diameter trees and existing down and dead fuel. The work will be accomplished using hand tools and chain saws to move, pile, and burn material.

- 310 acres of precommercial thinning of sapling-sized trees of lodgepole pine, western larch, Douglas-fir, spruce, subalpine fir, and a minor amount of other tree species. Approximately 15 acres of these will have hand piling of thinning slash and subsequent pile burning to reduce the risk of wildland fire. Treatment on these acres will promote the growth and health of the residual young trees in upland areas. These areas were not assigned unit numbers and are not described in tabular form. Please refer to the Precommercial Thinning Map (Figure A-2).

**Table A-1. Units for Commercial Harvest in the Selected Alternative.**

Unit Number*	Map Grid	Acres	Retention Level***	Treatment Method**	Regeneration Method	Site or Fuel Preparation	Logging System
1	D2	166	HDR	CT	N/A	Excavator pile	Ground based
2	D2	65	HDR	CT	N/A	Excavator pile	Ground based
3	D2	100	HDR	CT	N/A	Excavator pile	Ground based
4	D3	110	MDR	SW w/R	Natural	Excavator pile	Ground based
5	D2	33	HDR	CT	N/A	Excavator pile	Ground based
6	E2	177	MDR	SW w/R	Natural	Excavator pile	Ground based
7A	D2	25	MDR	SW w/R	Natural	Underburn	Skyline
8	D2	104	HDR	CT	N/A	Excavator pile	Ground based
9	E2	18	HDR	CT	N/A	Excavator pile	Ground based
10	E2	13	HDR	CT	N/A	Excavator pile	Ground based
11	E3	54	MDR	SW w/R	Natural	Excavator pile	Ground based
14	D1	150	HDR#	CT	N/A	Excavator pile	Ground based
15	C1	75	MDR	SW w/R	Natural	Excavator pile	Ground based
16	B1	53	HDR	CT	N/A	Excavator pile	Ground based
17	B1	64	LDR	ST w/R	Plant	Excavator pile	Ground based
19A	B1	70	LDR	ST w/R	Plant	Underburn	Skyline
21	A3	33	LDR	ST w/R	Natural	Excavator pile	Ground based
23A	B3	11	LDR	ST w/R	Natural	Underburn	Skyline
24	A4	31	LDR	ST w/R	Natural	Underburn	Ground based
25	C2	78	HDR	CT	N/A	Excavator pile	Ground based
26	C2	93	HDR	CT	N/A	Excavator pile	Ground based
28A	C3	28	LDR	ST w/R	Plant	Excavator pile	Skyline
29	B3	33	MDR	SW w/R	Natural	Underburn	Ground based
30	B3	35	LDR	ST w/R	Plant	Underburn	Ground based
32	A7	101	MDR	SW w/R	Plant	Excavator pile	Ground based
33	B4	42	MDR	SW w/R	Natural	½ pile, ½ burn	Ground based
34	B4	24	MDR	SW w/R	Natural	Underburn	Ground based
35	C4	94	MDR	SW w/R	Plant	Excavator pile	Ground based
36	C4	63	MDR	SW w/R	Plant	Excavator pile	Ground based
36A	C4	38	HDR	CT	N/A	Excavator pile	Skyline
37	C4	128	HDR	CT	N/A	Excavator pile	Ground based
39	B5	79	HDR	CT	N/A	Excavator pile	Ground based
39A	B5	26	HDR	CT	N/A	Excavator pile	Skyline
39B	C5	17	HDR	CT	N/A	Excavator pile	Skyline
40	B5	52	MDR	SW w/R	Natural	Excavator pile	Ground based
41A	B5	127	MDR	SW w/R	Plant	Excavator pile	STS
42	C5	31	HDR	CT	N/A	Excavator pile	Ground based
43	C5	34	HDR	CT	N/A	Excavator pile	Ground based
44	C5	29	HDR	CT	N/A	Excavator pile	Ground based
45	B5	15	HDR	CT	N/A	Excavator pile	Ground based
46	C6	17	MDR	SW w/R	Plant	Underburn	Ground based

Unit Number*	Map Grid	Acres	Retention Level***	Treatment Method**	Regeneration Method	Site or Fuel Preparation	Logging System
47	C5	53	HDR	CT	N/A	Excavator pile	Ground based
47A	C5	38	HDR#	CT	N/A	Underburn	Skyline
48	C6	73	MDR	SW w/R	Plant	Excavator pile	Ground based
48A	C6	7	MDR	SW w/R	Natural	Excavator pile	Skyline
49	C6	28	HDR	CT	N/A	Underburn	Ground based
51	B6	17	MDR	SW w/R	Natural	Underburn	Ground based
52	B6	120	LDR	ST w/R	Plant	Excavator pile	Ground based
53	B6	12	MDR	SW w/R	Natural	Underburn	Ground based
53A	B6	10	MDR	SW w/R	Natural	Underburn	Skyline
54	B7	33	MDR	SW w/R	Plant	Excavator pile	Ground based
55A	C7	132	MDR	SW w/R	Plant	Underburn	Skyline
56	A3	69	MDR	SW w/R	Natural	Excavator pile	Ground based
57	B7	9	LDR	ST w/R	Plant	Underburn	Ground based
58	C7	14	MDR	SW w/R	Plant	Excavator pile	Ground based
59	B7	8	MDR	SW w/R	Plant	Excavator pile	Ground based
60	B7	27	HDR	CT	N/A	Excavator pile	Ground based
61	B7	11	MDR	SW w/R	Plant	Excavator pile	Ground based
62	B7	11	HDR	CT	N/A	Excavator pile	Ground based
63	B7	14	MDR	SW w/R	Plant	Excavator pile	Ground based
64	B7	54	MDR	SW w/R	Plant	Underburn	Ground based
65	B7	68	HDR	CT	N/A	Excavator pile	Ground based
66A	B7	13	MDR	SW w/R	Natural	Underburn	Skyline
67	C8	39	HDR	CT	N/A	Excavator pile	Ground based
68	C8	9	HDR	CT	N/A	Excavator pile	Ground based
68A	C8	10	HDR	CT	N/A	Excavator pile	Skyline
69	C8	18	HDR	CT	N/A	Excavator pile	Ground based
69A	C8	3	MDR	SW w/R	Plant	Underburn	Skyline
71	B8	84	HAR#	SAN/SAL	Plant	Excavator pile	Ground based
71A	B8	12	HAR#	SAN/SAL	Plant	Excavator pile	Skyline
72	B8	43	HDR	CT	N/A	Excavator pile	Ground based
73	B8	49	MDR	SW w/R	Natural	Excavator pile	Ground based
73A	B8	64	MDR	SW w/R	Plant	Excavator pile	STS
74	B8	66	MDR	SW w/R	Plant	Excavator pile	Ground based
74A	B8	20	MDR	SW w/R	Natural	Excavator pile	Skyline
76	C8	30	HDR	CT	N/A	Excavator pile	Ground based
76B	C8	4	MDR	SW w/R	Plant	Underburn	Skyline
77	C8	13	HDR	CT	N/A	Excavator pile	Ground based
78	B9	10	MDR	SW w/R	Plant	Excavator pile	Ground based
79	C9	13	HDR	CT	N/A	Excavator pile	Ground based
80	C9	18	MDR	SW w/R	Plant	Excavator pile	Ground based
81	C9	43	LDR	ST w/R	Plant	Excavator pile	Ground based
82	C9	26	LDR	ST w/R	Plant	Excavator pile	Ground based
85	B9	17	MDR	SW w/R	Plant	Underburn	Ground based
86	B9	16	HDR	CT	N/A	Excavator pile	Ground based
87	B9	8	HDR	SAN/SAL	N/A	Excavator pile	Ground based
88	B8	36	LDR	ST w/R	Plant	Underburn	Ground based
91	B9	22	MDR	SW w/R	Plant	Excavator pile	Ground based
99	B8	7	LDR	ST w/R	Plant	Excavator pile	Ground based
99A	B8	10	LDR	ST w/R	Plant	Underburn	Skyline
100	A8	62	MDR	SW w/R	Plant	Excavator pile	Ground based
100A	A8	5	MDR	SW w/R	Plant	Excavator pile	Skyline
101	A8	112	MDR	SW w/R	Plant	Excavator pile	Ground based
101A	A8	14	MDR	SW w/R	Plant	Underburn	Skyline

Unit Number*	Map Grid	Acres	Retention Level***	Treatment Method**	Regeneration Method	Site or Fuel Preparation	Logging System
102	A8	9	MDR	SW w/R	Plant	Excavator pile	Ground based
103	A6	42	MDR	SW w/R	Plant	Excavator pile	Ground based
105	C3	18	HDR	CT	N/A	Excavator pile	Ground based
106	B1	18	MDR	SW w/R	Natural	Excavator pile	Ground based
107	B2	24	MDR	SW w/R	Natural	Excavator pile	Ground based
108	B2	51	MDR	SW w/R	Natural	Excavator pile	Ground based
109	B4	61	MDR	SW w/R	Natural	Excavator pile	Ground based
111A	B6	21	MDR	SW w/R	Natural	Underburn	Skyline
112A	C7	33	MDR	SW w/R	Natural	Excavator pile	Skyline
114	B9	38	MDR	SW w/R	Plant	Excavator pile	Ground based
117	B9	52	MDR	SW w/R	Plant	Excavator pile	Ground based
120A	B9	10	MDR	SW w/R	Plant	Underburn	Skyline
124	B8	52	MDR	SW w/R	Plant	Excavator pile	Ground based
124A	B8	48	MDR	SW w/R	Plant	Excavator pile	Skyline
126	B8	25	MDR	SW w/R	Plant	Underburn	Ground based
126A	B8	16	MDR	SW w/R	Plant	Underburn	STS
127	A7	171	MDR	SW w/R	Natural	Excavator pile	Ground based
127A	A7	116	MDR	SW w/R	Natural	Excavator pile	STS
128	A6	52	HDR	CT	N/A	Excavator pile	Ground based
131	A9	18	MDR	SW w/R	Natural	Excavator pile	Ground based
132	B4	17	MDR	SW w/R	Natural	Excavator pile	Ground based
132A	B4	48	MDR	SW w/R	Natural	Underburn	Skyline
133	B5	36	MDR	SW w/R	Plant	Excavator pile	Ground based
134	B5	131	MDR	SW w/R	Natural	Excavator pile	Ground based
135	C7	29	MDR	SW w/R	Natural	Excavator pile	Ground based
136	B6	10	MDR	SW w/R	Plant	Excavator pile	Ground based
136A	B6	31	MDR	SW w/R	Plant	Underburn	Skyline
137	B8	14	MDR	SW w/R	Plant	Excavator pile	Ground based
137A	B8	25	MDR	SW w/R	Plant	Excavator pile	Skyline
138A	B3	20	MDR	SW w/R	Plant	Underburn	Skyline
139	D3	39	HDR	CT	Plant	Excavator pile	Ground based
140	D3	6	HDR	CT	Plant	Excavator pile	Ground based
<b>TOTAL</b>		<b>5521</b>					

\* Units with an A or B designation indicate a skyline logging system or a skyline tractor swing (STS) system.

All other units are ground-based.

\*\*Treatment Method:

SW w/R = Shelterwood-reserve; ST w/R = Seed Tree w/ reserve; CT = Commercial Thin; SAN/SALV = Sanitation/Salvage

\*\*\*Retention Levels: (please refer to FEIS Chapter 3, Vegetation Affected Environment)

LDR = Light dispersed retention

MDR = Moderate dispersed retention

HDR = Heavy dispersed retention

HAR = Heavy aggregated retention

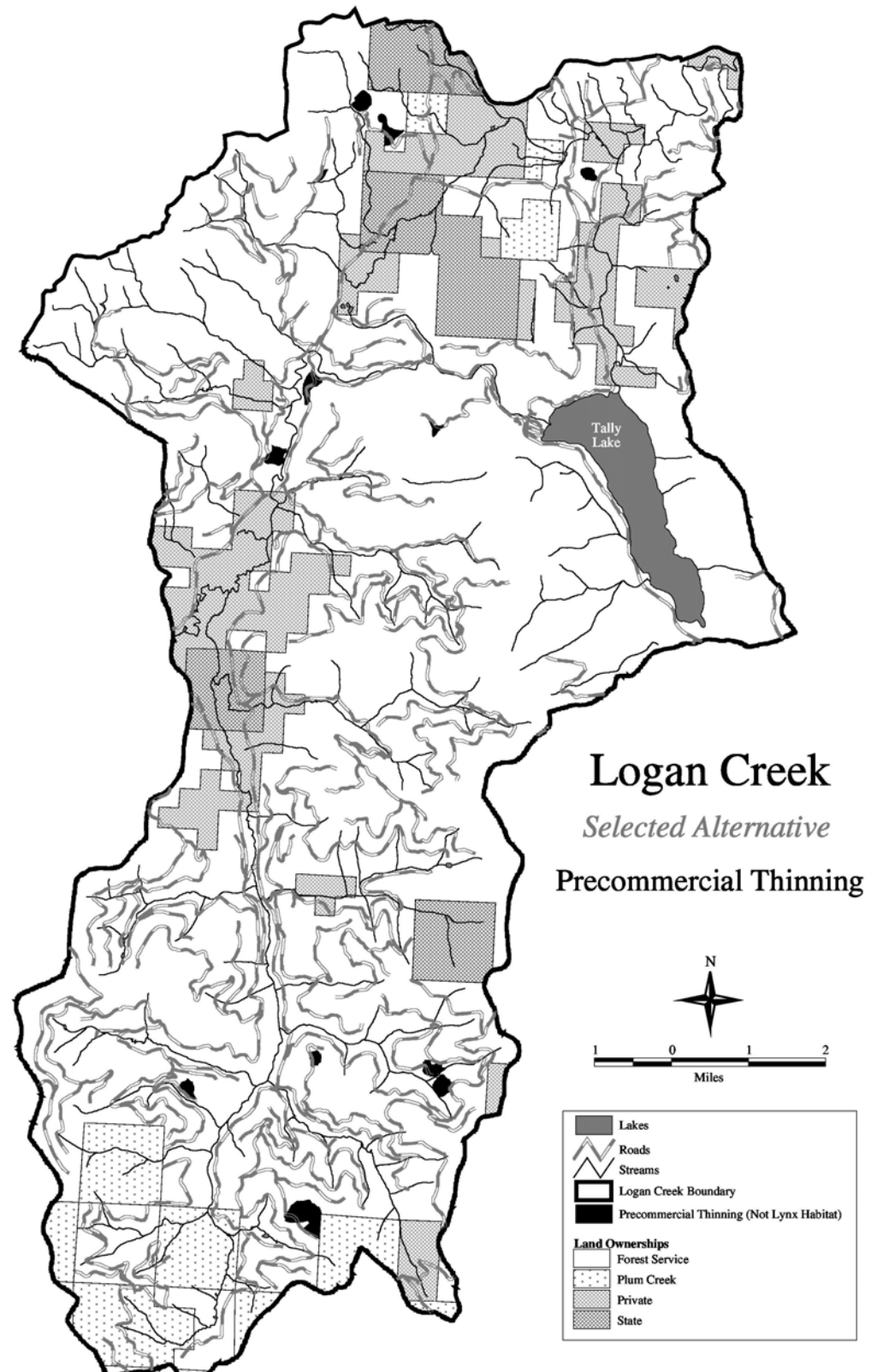
LAR = Light aggregated retention

# Please see Chapter 3, Vegetation Section, Alternative B, Stand Groups in the FEIS for a detailed discussion of retention levels for these units.

Figure A-1

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Figure A-2. Precommercial Thinning Map



**Table A-2. Prescribed Burn Units for Wildlife Habitat Improvement and/or Fuel Reduction.**

Unit Number	Description	Acres	Retention Level
200	Tally Lake	169	HDR
201	Middle Logan Creek	56	HDR
202	Tally Mountain	157	HAR
202.1	Tally Mountain	123	LDR
203	Oettiker Creek	61	HDR
	Total:	566	

**Table A-3. Fuel Reduction Areas using Hand Techniques.**

Unit Number	Description	Acres	Retention Level
300	Highland Meadows	157	HDR
301	Reid Creek	23	HDR
302	Ashley Mountain	2	LDR
	Total:	182	

Openings Over 40 Acres. Forest Service Manual 2400, Supplement Number R1 2400-2001-2, approved February 1, 2002, states that openings created by even-aged silviculture that exceed 40 acres will be allowed, provided there is a 60-day public review period and the Regional Forester approves. The Logan Creek DEIS completed in May 2003 identified alternatives that proposed openings greater than 40 acres in size. A 60-day comment period began on June 8 with publication of a notice in the Daily Interlake and ended August 8, 2003, with no comments received from the public or other agencies regarding the size of proposed openings. The Regional Forester has approved creation of 33 even-aged openings ranging in size from 42 acres to 177 acres. The rationale for exceeding the 40-acre opening size includes the necessity to create effective fuel reduction zones, reduce the number of entries thereby avoiding detrimental effects on wildlife security, improve scenic quality by following topographic features, and the necessity to effectively treat stands containing Douglas-fir that are affected by Douglas-fir bark beetles and root rot. Many of these openings over 40 acres are created as a result of regeneration harvest adjacent to existing openings that have not reached a conifer sapling size class. Please refer to Exhibit P-25 for documentation and Regional Forester approval.

Riparian Habitat Conservation Area (RHCA) treatments. I am directing the salvage of beetle-killed Douglas-fir trees in approximately four acres of riparian area. Treatment on these acres will improve the overall health of the remaining stand of timber by removing trees infested with Douglas-fir bark beetles and removing fuels that could contribute to future severe wildland fires. This activity is located in an RHCA on the north side of Logan Creek approximately two miles upstream from the Tally Lake Campground. This area is designated as Unit 138A on Figure A-1. This unit has a Moderate Aggregated Retention level prescription. No equipment will come closer than 200 feet from the stream and most salvaging will take place uphill from the 200-foot buffer.



A site-specific review of this commercial harvest near Logan Creek was conducted and is documented in Exhibit F-4. This RHCA treatment is in compliance with INFISH goals and will improve Logan Creek riparian function and condition. The work proposed is also in compliance with LRMP Amendment #3. Because no harvesting is proposed on trees within recruiting distance to Logan Creek, the standards on tree retention and shade retention are readily achieved.

## Transportation Management

Table A-4 contains a detailed summary of proposed road construction involved with the Selected Alternative. New road construction is proposed to allow access to the vegetation treatments described earlier. Forest "system roads" refer to the roads maintained by the Forest Service for current and future use. A temporary road refers to a road constructed for short-term use and is reclaimed soon after the use is completed. Proposed road construction for the Selected Alternative is depicted on Figure A-1.

Rehabilitation involves improving roads to meet or exceed Best Management Practices guidelines, a process that generally installs or improves drainage features. Rehabilitation is proposed for roads that we anticipate will have heavy traffic.

### *Road Construction and Improvement*

- Approximately 3.8 miles of system road will be built to access harvest units. General specifications of system roads are single lane with turnouts and a five-mile per hour design speed. The roads would be designed to accommodate logging trucks and skyline equipment. Road surfaces would be approximately 14 feet wide. Traffic service would be Level D, and road maintenance will be Maintenance Level 1 (traffic service and maintenance level definitions can be found in the Flathead Forest Plan (USDA Forest Service 1986)). All system road construction would employ Best Management Practices (see Appendix C of the FEIS). Approximately a one-quarter mile section of proposed System Road 1 crosses land administered by the Montana Department of Natural Resources and Conservation (DNRC). Use of this section of road by the Forest Service will be by permit.
- Approximately 4.5 miles of temporary road will be built; these temporary roads will be reclaimed after use. General specifications of temporary roads are the same as for system roads described above. All temporary road construction would employ Best Management Practices (see Appendix C). Temporary Road 3 to access Unit 24 in Sanko Creek will require construction of a crossing over an intermittent stream. This is the only stream crossing necessary for all proposed road construction.
- Rehabilitation of drainage systems to comply with Best Management Practices on approximately 133 miles of system roads. A detailed list of roads that will be rehabilitated is found in Exhibit M-1.
- Road maintenance actions consisting of brushing and blading may be needed on some of the haul roads within the project area. Other drainage work such as the placement of

drain dips and additional culverts will likely take place. Dust abatement and blading will occur as needed on the main haul routes.

**Table A-4. Road Construction for Implementation of the Selected Alternative.**

Type of Road and Number	Area	Length	Units Accessed
System Roads			
1	Oettiker Creek	1.72	41A, 133
2	Reid Creek	0.37	35, 37
18	Johnson Peak	1.55	North Johnson
22	Johnson Peak	0.14	North Johnson
		Total: 3.78	
Temporary Roads			
1	Highland Meadows	0.72	6, 7A
2	Evers Creek	0.41	15
3	Sanko Creek	0.10	24
6	Reid Creek	0.07	132A
9	Bill Creek	0.44	73, 74A
13	Meadow Creek	0.61	99, 99A, 100, 100A
14	Evers Creek	0.43	25, 26
15	Evers Creek	0.19	108
16	Meadow Creek	0.53	127, 127A
17	Meadow Creek	0.13	127A
18	Bill Creek	0.46	137, 137A
19	Oettiker Creek	0.44	134
		Total: 4.53	

#### ✓ Road Reclamation

The Proposed Action includes reclamation of approximately 16.6 miles of road to improve water quality and wildlife security within the Logan Creek area. Refer to Table A-5 for a list and Figure A-3 for a map of roads planned for reclamation. Most roads to be reclaimed are currently closed to the public by gates or berms. The open roads that will be reclaimed are receiving little or no use as observed by Forest Service personnel. No foreseeable management activities are planned on or near the roads that will be reclaimed. Reclamation of these roads complies with the direction of the 1976 National Forest Management Act.

Reclamation will be done in such a way as to protect water quality by reducing the potential for future sedimentation. Road templates will be left in place to minimize ground disturbance. Some of the reclamation actions that will occur include treatments to reduce existing noxious weeds, removal of drainage features that require active maintenance (such as culverts), installation of drainage features such as waterbars, and berm construction.

Culvert removals and stream restoration will occur where roads to be reclaimed intersect streams. The number of culverts that need to be removed are yet to be identified; the actual number depends on channel condition, culvert size, distance to culvert from a drivable road, and the amount of vegetation to be disturbed accessing the culvert with machinery. To reduce the amount of ground disturbed, cross-drain culverts will typically not be removed, but

Figure A-3

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waterbars will be placed nearby. The amount of physical altering of the road template from culvert removal or water bar creation will vary according to the sites involved.

Funding for reclamation may be from various resource areas, including transportation system maintenance, wildlife and fisheries enhancement, and Knudsen-Vandenberg (KV) funds from timber sale receipts.

Road reclamation will involve the removal of culverts and the construction of berms, both ground-disturbing activities that have potential for noxious weed establishment. Disturbed sites will be seeded to speed revegetation of native plants and minimize potential for weed establishment. These activity locations will be noted on maintenance inventory plans for monitoring weed establishment. Noxious weed control activities will be consistent with the Flathead National Forest Weed Control Environmental Assessment and Decision Notice.

Some road reclamation will take place on roads that pass through or are adjacent to existing old growth habitat. Where these roads have downed trees laying across the roadway when the reclamation process begins, all logs must be left intact wherever possible and replaced across the roadway after reclamation is complete. This measure will help retain downed wood habitat features and continuity of habitats in these old growth stands. See Exhibit Q-15 for details of roads that meet these criteria.

Three road segments totaling 1.3 miles are currently open to the public yearlong, though receiving little use, and will be reclaimed. Two of the segments (Roads 2971 and 9537) are short and allow limited opportunity for resource management or fire suppression. The third segment (Road 9617) is currently not passable by automobiles due to grown-in vegetation and is being used as a narrow trail. Reclamation will be accomplished to reduce production of sediment from drainage features and retain the roadway as a trail.

#### ✓ *Road Improvement on Road 913*

The Selected Alternative will involve road improvements for the Logan Creek Road 913 between Tally Lake and the Star Meadow Road to address chronic sediment deposition in Logan Creek. Improvement will take place over a length of about three miles. These improvements will include projects such as replacement or installation of several drainage culverts, buttressing toe of slumping cut bank slopes with rip-rap, armoring culvert catch basins with rip-rap, cleaning bridge surfaces, constructing drain dips, and installing filtering devices. Vegetation such as shrubs will be planted in the riparian area between the road surface and the stream bank to intercept side cast from road blading operations. A detailed description of this project with logs for Road 913 is found in Exhibit M-2. The location of this activity is shown on Figure A-3.

#### ✓ *Road Restrictions*

The Selected Alternative will implement road restrictions to improve wildlife security within the Logan Creek watershed. Approximately 6.2 miles of roads that are currently open year-round will be closed year-round to public motorized access. These closures will require installing one new gate and moving the location of another. Refer to Table A-6 and Figure A-4. Snowmobile access will remain available on these roads from December 1 to May 14.

**Table A-5. Roads to be Reclaimed with the Selected Alternative.**

Road Number	Road Name	Reclaim Miles	Current Status
313	Logan Creek	1.00	Closed yearlong
313N	Pike Logan	1.00	Closed yearlong
313T	Pine Martin	0.50	Closed yearlong
313V	Logan Creek V	0.60	Closed yearlong
313Y	Logan Creek Y	1.50	Closed yearlong
2886	West Pike Creek	1.50	Closed yearlong
2886B	West Pike Creek B	1.00	Closed yearlong
2913	Reid Basin-Lost Creek	0.30	Closed yearlong
2915	Cyclone Logan	0.60	Closed yearlong
2917	Cyclone Creek	0.40	Closed yearlong
2971	Deer Meadows	0.30	<i>Open yearlong</i>
5395	That's It	0.10	Not on map (closed)
9502	Sanko Creek	1.00	Closed yearlong - berm
9504	Crow's Neck	0.80	Open Seasonally - brush
9506	Old Out House	0.50	Open Seasonally - brush
9524	Moose Basin	0.50	Closed yearlong
9537	Sanko Yew	0.40	<i>Open yearlong</i>
9538	Cyclone Basin	0.60	Closed yearlong
9583	Logan Knob	0.60	Closed yearlong
9617	West Tally	0.60	<i>Open yearlong</i>
9677A	Lower Boundary	0.60	Closed yearlong
9763D	Moose Hollow	0.30	Closed yearlong
9895	Johnson Hill	0.40	Closed yearlong
10268	Cyclone Bottom	0.80	Closed yearlong
10360	Sanko Pit	0.70	Not on map (closed)
Total Miles:		<b>16.60</b>	

**Table A-6. Roads to Change to Yearlong Closure.**

Road Number	Road Name	Miles	Current Status
2909	Taylor Creek	3.60	<i>Open Yearlong</i>
2909B	Taylor Quarry	0.20	<i>Open Yearlong</i>
10436	Mushroom Cap	2.00	<i>Open yearlong</i>
11258	South Logan	0.40	<i>Open Yearlong</i>
Total Miles:		6.20	

### ✓ Trail Construction

The Selected Alternative proposes trail construction near Tally Lake Campground to complete a short loop trail. Construction will be an extension of Trail 804 and consist of about 2000 feet of new trail. This trail is shown on Figure A-3.

### ✓ Trail Restrictions

To improve wildlife security within the Logan Creek watershed, approximately 12.7 miles of trail will have a seasonal restriction on motorized use. The season of motorized closure will be September 1 to November 30. The section of trail that this closure will be implemented on is Trail 800 from Road 11536 eastward and northward along Reid Divide to the junction with Trail 294. This proposed trail restriction is depicted on Figure A-4.

## **Fisheries Habitat Improvement**

Several stream segments were identified as having low potential for large woody debris recruitment. These segments all occur where past timber harvest occurred near the streams. Large logs will be placed and secured in these streams to create improved fisheries habitat. This activity will be conducted on as much as 3.7 miles of stream over 19 stream segments.

The lower reaches of Logan Creek near Round Meadow (T31N, R23W, Section 8) have been identified as having a limited number of large pools. We will construct larger pools in about five locations to create better fisheries habitat. These pools will be constructed with an excavator by enlarging the pool with the bucket and placing large rocks on the upstream side of the pool. Proposed locations for the large pools and the large woody debris placement are shown on a map in Exhibits F-7 and F-8.

## **Wildlife Habitat Improvement**

Many areas proposed for timber harvest would benefit from shrub planting to supplement naturally occurring browse or hiding cover. This may be implemented if funding is available. Shrub planting will enhance big game forage, feeding and nesting sites for songbirds, and hiding cover values for a wide variety of wildlife species. Shrub planting will usually consist of willow, serviceberry, red-osier dogwood, mountain maple, and/or redstem ceanothus at a density of 100 to 300 plants per acre. Shrub planting will generally take place in those timber harvest units with light to moderate retention levels, generally with sources of water in the vicinity. Post-harvest site conditions and conifer regeneration success will determine which specific areas shrub planting will be conducted; however, the total maximum area to be treated will range from 100 to 500 acres.

Other areas near riparian zones that experienced timber harvesting in the past will have supplemental tree and shrub planting in order to promote browse and cover. This activity will be conducted on as much as 90 total acres adjacent to 19 stream segments. Locations for tree and shrub planting are shown on a map in Exhibit F-8.

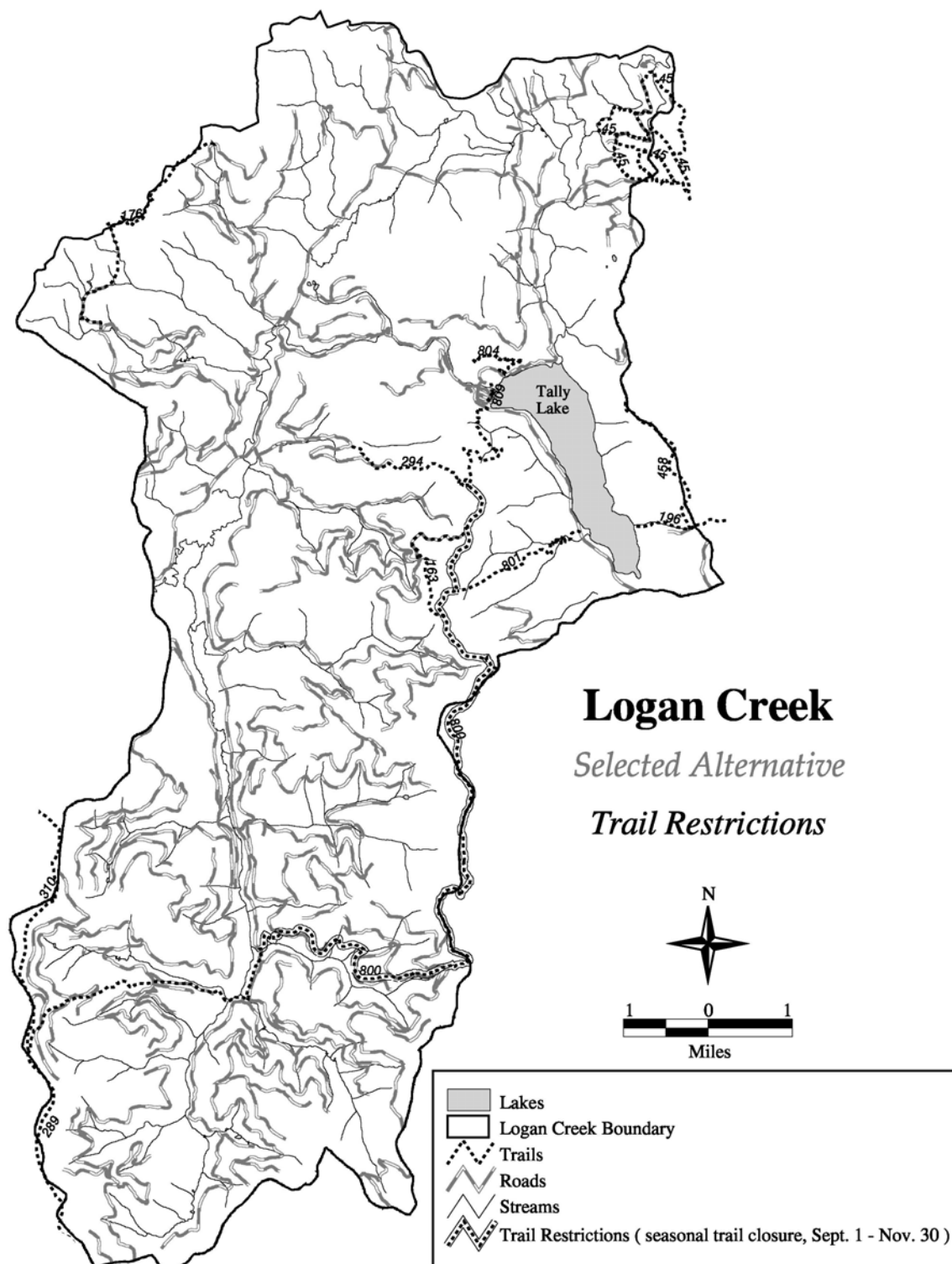
## **Design Criteria**

The required design criteria I have selected are provided in Chapter 2 of the FEIS and Appendix C of this decision document.

## **Project Monitoring**

The monitoring plan I have selected is provided in Chapter 2 of the FEIS and in Appendix D of this ROD. These monitoring items are required in order to determine compliance with the Selected Alternative design criteria, requirements, and objectives. This plan includes monitoring goals, objectives, and parameters to be monitored; where and when monitoring will occur; who is responsible; and how the information will be evaluated. If corrective actions are deemed necessary, they will be identified and designed based on monitoring results and evaluation.

Figure A-4. Trail Restrictions Map





## APPENDIX B: DESIGN CRITERIA for the SELECTED ALTERNATIVE

### Soils

To minimize erosion and other detrimental impacts to the soil resource, all road construction, reconstruction, and timber harvest will be completed using Best Management Practices (BMPs) or Soil and Water Conservation Practices (SWCPs). The practices are described in detail in the Forest Service Soil and Water Conservation Handbook (FSH 2509.22), the Soil Management Handbook (FSH 2509.18), and the Flathead Forest Plan (pages II: 49-55). Included are such practices as providing for sufficient road drainage, limiting tractor logging operations to periods when soils are dry or under winter snow and less subject to compaction, seeding of landings and cut-and-fill slopes of roads, and maintaining vegetative buffer strips between cutting units and streams for sediment filtration. Each harvest unit and the proposed roadwork will be reviewed and applicable SWCPs identified on a site-specific basis for protection of the soil and water resource. These practices for the Selected Alternative are listed in Appendix C in the FEIS.

To develop design criteria for the Selected Alternative, the following three soil groups based on soil characteristics are used: sensitive soils, non-sensitive soils, and soils with potential for low organic matter. Soils are sensitive when they have a high content of clay and silt, few rocks or gravel, and high water-holding capacity. Non-sensitive soils have enough rocks and gravel to provide support to ground-based equipment operating on the soils. Water drains out of these soils and they do not hold enough water to make them soft for extended times. Soils with potential for low organic matter lack woody debris or fine organic material after timber harvest and fuels reduction operations are completed, thus possibly resulting in low soil nutrients needed in forested soils.

### *Harvest Activities on Sensitive Soils*

Sensitive landtypes vary from one area to another depending on climate, geology, and soil characteristics. Sensitive landtypes in the analysis area are those that have fine-textured soils with high water-holding capacity and few rocks. These soils have high productivity, but because of their physical characteristics are subject to compaction and displacement during management activities, especially those activities that use ground-based equipment. This disturbance is most likely to occur when the soils are wet. Within the Logan Creek analysis area, Landtype 14-2 and all riparian landtypes are sensitive.

Only Unit 101A of the Selected Alternative is located on a sensitive soil type (Landtype 14-2). This unit will be harvested using a skyline yarding method, and fuels reduction will be accomplished using broadcast underburning. No heavy equipment will be used in this unit. All fire lines in Unit 101A will have water bars that direct water onto unburned soils outside the burn.

### *Harvest Activities on Nonsensitive Soils*

The majority of management activities in the analysis area will occur on nonsensitive soils (all units not listed as occurring on sensitive soils). Even though they are not particularly vulnerable to the effects of mechanized equipment, the following practices will be used to reduce impacts on harvest units that are not on sensitive soils.

- Conventional ground-based equipment such as feller-bunchers, dozers, and rubber-tired skidders will be allowed to disperse skid if soils are dry as determined by the sale administrator in the field. The sale administrator will use the method outlined in Exhibit H-20 (USDA 1998), using the dry or slightly moist categories as the criteria for dry soils. When soils are determined to be wetter than the slightly moist category but equipment is not yet causing soil displacement, equipment will be restricted to dedicated skid trails laid out in a pattern that occupies less than 15 percent of the timber harvest unit. The 15 percent threshold is described in Forest Service Manual 2554 (Exhibit H-19) and is further clarified in Exhibit H-9.
- Within units located on areas with previous soil detrimental effects, activities will be designed so past and proposed activities disturb no more than 15 percent of the unit's area (Exhibit H-19). Units 25 and 26 show evidence of soil disturbance from undocumented timber harvesting early in the last century. In these two units, skid trails will be designated to use these previously disturbed sites and all disturbances, both historic and current, will occupy less than 15 percent of the timber harvest units. The sale administrator must approve the locations of the skid trails.
- Excavators used for site preparation or brush disposal can operate when soils are rated as *moist or drier* as determined in the field using the guide in Exhibit H-20. The intent is to reduce the severity of impacts from equipment use, and operating when soils are relatively dry does accomplish that.
- Log forwarders that operate on a mat of slash and debris on all skid trails can operate when soils are moist or drier as described in Exhibit H-20. Skid trails for this equipment can occupy up to 25 percent of the cutting unit because the slash protects the soil from displacement and compaction.

### *Harvest Activities on Soils With Potential for Low Organic Matter*

Part of the intent of timber harvesting involved with the Selected Alternative is to reduce the amount of fuel by removing biomass that has accumulated beyond desirable levels. However, it is also necessary to retain fine woody and herbaceous debris (green needles, leaves, and branches less than 3" in diameter) because these materials contain a large portion of the nutrients available for plant growth and other ecosystem functions, particularly on sites that are currently somewhat deficient in organic matter. The value of fine woody and herbaceous material is particularly important in the first three to six months after timber harvest because decomposition and leaching of important elements occur during that period.

The following additional feature is prescribed to accomplish both goals of reducing fuels and maintaining nutrients on the site:

- For all units designated for Low and Moderated Dispersed Retention (LDR and MDR), slashing unmerchantable trees must occur during the same season as harvesting. Subsequent piling and burning of hazardous fuels must be delayed three to six months (including one wet season) after the harvesting to allow sufficient time for leaching of important elemental nutrients into the soil. Units 1, 3, 4, 6, 11, 15, 21, 28A, 41A, 56, 59, 106, and 133 are excluded from this procedure due to concerns with short-term fuel accumulations in the wildland/urban interface. Slash within these units will be piled soon after harvesting to minimize the risk of wildland fire during the first summer after harvesting; piles will be burned as soon as weather conditions permit.

### **Water/Fisheries/Riparian**

Implementation of the Selected Alternative will involve rehabilitation of drainage features on 133 miles of system roads, meeting or exceeding Best Management Practices (FEIS, Appendix C). Culverts will be replaced on up to 11 identified sites on system roads. Additional culvert replacement may occur as opportunities are identified during project implementation.

Disturbed soil from road reclamation (waterbars and culvert removals) will be seeded. Culvert removal sites will be mulched with straw. Shrubs will be planted adjacent to streams in all culvert removal sites to stabilize soil.

Many of the BMPs applied to protect the soil resource will also protect watershed, fisheries, and riparian values. Measures described by the Streamside Management Zone Act (SMZ-1993, also referred to as Montana House Bill 731) and listed in Appendix D of the FEIS will protect all perennial and intermittent streams flowing adjacent to harvest units. The units will also be consistent with guidelines and standards within the Inland Native Fish Strategy Environmental Assessment and its July 1995 Decision Notice.

#### *Road Maintenance*

Road maintenance actions consisting of brushing and blading may be needed on some of the haul roads within the project area. Other minor drainage work such as the placement of drain dips will likely take place. Dust abatement and blading will occur as needed on the main haul routes.

#### *Temporary Road Obliteration*

All temporary roads constructed for timber harvest will be obliterated immediately after mechanical slash reduction activities are complete or after the timber harvest activity is complete if the unit is to be underburned. Obliteration will consist of removal of any culverts, recontouring the slope, and revegetating the disturbed area with native grasses, shrubs, and trees.

#### *Fisheries Enhancement Projects*

The Selected Alternative will involve placement of large woody debris (logs greater than 12 inches diameter and two-thirds the length of the channel width) in various locations within

streams throughout the project area to create improved fisheries habitat. Woody debris will be placed at a density of approximately one piece per 50 to 100 feet of stream. This will improve stream bank stability and trap bedload resulting from past riparian zone disturbances. This activity will be conducted on as much as 3.7 miles of stream over 19 stream segments.

To create better fisheries habitat, large fish habitat pools will be constructed in about five locations in the lower reaches of Logan Creek near Round Meadow (T31N, R23W, Section 8), an area with limited large pools. These pools will be constructed with an excavator by enlarging the pool with the bucket and placing large rocks on the upstream side of the pool. Proposed locations for the large pools and the large woody debris placement are shown on a map in Exhibits F-7 and F-8.

### **Air Quality**

All prescribed burning conducted in this area will be in compliance with the Smoke Management Plan prepared by the Montana Air Quality Bureau and administered by the Montana State Airshed Group (Forest Plan, page II-64). Burning plans will be developed where prescribed burning is the method selected for slash hazard reduction, site preparation for reforestation, and browse stimulation. When feasible, prescribed burning will be conducted in the spring or summer instead of the fall. This will provide for better smoke dispersion conditions than normally occurs in the fall burning season. Nighttime burning that could affect local communities will be avoided because smoke dispersal is worst during this time. Stumps and heavy fuels (logs) will be fully extinguished adjacent to private land with residences to reduce the lingering smoke that can occur from these smoldering fuels, as well as to reduce the chance of escaped fire.

To manage the effect on air quality, all planned ignitions for post-sale site preparation/fuel reduction treatments will be conducted according to guidelines of the Montana Smoke Management Memorandum of Agreement. The Environmental Protection Agency (EPA) has approved these plans as meeting the requirements of the Clean Air Act as amended in 1987. These plans regulate the amount of forestry-related burning that can be done at any one time. The amount of burning that can occur on any given day depends upon the specific type of burning, the tons of material to be burned, and the atmospheric conditions available to promote mixing and transport of smoke away from sensitive areas.

### **Wildlife Habitat**

#### *Non-Game Wildlife Habitat*

Amendment 21 of the Flathead Forest Plan specifies the minimum number of snags, snag replacement trees, and pieces of downed wood to be left in each potential vegetation group (PVG). Although the minimum diameters are not always present in a given stand, these will be retained to meet or exceed the intent of the Forest Plan wherever they exist (Exhibit Rd-3). To provide for these snag and downed wood retention needs, as well as living tree canopy and large trees, the following will be prescribed:

- All live larch and ponderosa pine greater than 18 inches at Diameter Breast Height (DBH) will be retained. DBH is typically the diameter measured four and a half feet

above the ground on standing trees and snags or the diameter of downed logs four and a half feet from the butt end of the log.

- All existing larch and ponderosa pine snags greater than 18 inches DBH will be retained, unless leaving them would compromise loggers' safety, as corroborated by the Forest Service sale administrator.
- Wherever present, at least two Douglas-fir per acre greater than 25 inches DBH will be retained unless they are infested with Douglas-fir bark beetles at the time of marking, or where leaving them would compromise safety.
- Snags that are felled for safety concerns will be left on the ground to function as large woody debris habitat.
- Wherever present, at least 32 downed logs per acre that are 9 to 20 inches DBH and at least 20 feet long will be left evenly distributed across the units. If there are too few large enough logs, 6 to 9 inches DBH logs may be substituted to reach this number of pieces.
- Wherever present, at least 15 downed logs per acre that are greater than 20 inches DBH and at least 6 feet long will be left evenly distributed across the units.
- Some slash piles will be left unburned in units that have Heavy Dispersed Retention prescriptions, as described in Exhibit Rd-10.

Prescribed burning may consume some of these existing snags, an unavoidable consequence in order to achieve the desired fuel reduction, site preparation, and browse stimulation. Some of the live trees left on the site may also be killed by burning, but will likely remain standing and provide for current snag habitat needs and future downed woody material. The live trees that survive the burn will provide future snag replacements for snag-dependent wildlife species. They will also increase the vertical diversity of the vegetation within these units, enhancing wildlife habitat.

### **Old Growth Habitat**

Some road reclamation will take place on roads that pass through or are adjacent to existing old growth habitat. Where these roads have downed trees laying across the roadway when the reclamation process begins, all logs must be left intact wherever possible and replaced across the roadway after reclamation is complete. This measure will help to retain downed wood habitat features and continuity of habitats in these old growth stands. See Exhibit Q-15 for details of roads that meet these criteria.

### ***Wildlife Security***

Hunting, transporting of hunters, and transporting of game will be prohibited by timber, road building, or other contract workers while working on or off roads closed to motorized vehicles to the general public.

Personal use firewood gathering will not be allowed by contractors or other workers on newly constructed roads or any other roads not open to motorized use by the general public.

Road access changes for the Selected Alternative (listed in Appendix A of this document) will enhance wildlife security.

All newly constructed roads will be closed by sign or gate to public motorized use during and after road building and other activities. All existing roads currently closed to public motorized use will remain closed during implementation of all proposed activities.

Timber harvest and mechanized fuel reduction activities will not occur in Units 2, 3, 200, and 300 during the period between October 15 and April 15 for big game winter range security.

### *Big Game Habitat Enhancement*

Supplemental shrub planting in harvest units is an opportunity that may be implemented if funding is available. Shrub planting would enhance big game forage, feeding and nesting sites for songbirds, and hiding cover values for a wide variety of wildlife species. Shrub planting would usually consist of willow, serviceberry, red-osier dogwood, mountain maple, and/or redstem ceanothus at a density of 100 to 300 plants per acre. Shrub planting would generally take place in those timber harvest units with light to moderate retention levels, generally with sources of water in the vicinity. Post-harvest site conditions and conifer regeneration success would determine on which specific areas shrub planting would be conducted; however, the total maximum area to be treated would range from 100 to 500 acres by alternative.

Areas near riparian zones that experienced timber harvesting in the past are proposed for supplemental tree and shrub planting to promote browse and cover. This activity would be conducted on as much as 90 total acres adjacent to 19 stream segments. Proposed locations for tree and shrub planting are shown on a map in Exhibit F-8.

### *Threatened, Endangered, and Sensitive Wildlife*

Activities will be stopped or modified if a grizzly bear den, Canada lynx den, gray wolf den, gray wolf rendezvous site, or bald eagle nest is discovered in or close proximity to a project location.

All contractors and others implementing the project will be required to comply with a food-storage and sanitation order.

## **Vegetation**

### *Timber*

In units to be naturally regenerated, phenotypically superior leave trees will be selected whenever possible to increase the likelihood of leaving superior genotypes as seed sources.

### *Fuels Reduction*

Prescribed fire management plans ("burn plans") will be written for each individual prescribed burn and will include plans for ignition, holding, escaped fire contingency, mop-up, and patrol. This will ensure that each burn meets the objectives prescribed for that particular area. The plan is designed to use the prescribed weather, personnel, and equipment that are needed to control the burn within the identified boundaries.

Submerchantable-sized trees will typically be felled or “slashed” and subsequently piled and burned in order to reduce the amount of ladder fuels in the residual stand.

Spring season prescribed underburning of brush fields, forest understory, and other forest vegetation will occur when fuel and weather conditions allow for safe and effective operations on approximately 566 acres, which is described in detail and shown on a map in Appendix A of this document. Some slashing or other pretreatment of forest vegetation may be necessary in these units. This burning will reduce fuel levels, improve habitat for wildlife, and will return the forest structure of these areas closer to historical conditions.

Fuels treatment without a commercial timber harvest or underburning will occur on about 182 acres, as described in detail and shown on a map in Appendix A of this document. This treatment will reduce fuel levels and return the forest structure of these areas closer to historical conditions. Vegetative materials to be piled and burned are brush and small-diameter trees and existing down and dead fuel. The work will be accomplished using hand tools and chain saws to move, pile, and burn material.

The Selected Alternative will create a 200- to 300-foot wide fuel treatment zone in which handpiling and pile burning of slash will occur where a precommercial thinning unit is adjacent to private ownership. Fifteen acres will receive this treatment. Please refer to the Fire Effects section of Chapter 3 for further explanation.

Underburning for fuels reduction and other ecosystem processes will not consume commercial wood products that could be removed in an economically viable manner. However, it is possible that the fire will consume commercial-sized individual trees, both live and dead, that are not located near existing roads, are scattered, or are on ground too steep to allow for removal without excessive cost.

### *Noxious Weeds*

Invasion and spread of noxious weeds is a concern in the analysis area. New cut and fill slopes will be seeded with a certified weed-free grass species mix for erosion control and to prevent establishment of noxious weeds. Any non-native seed applied will be short-lived or non-invasive.

During project implementation, logging, site preparation, and road reclamation equipment used in the area will be washed to remove weed seeds. This action is consistent with recommendations in Losensky’s Internal Report "An Evaluation of Noxious Weeds in the Lolo, Bitterroot, and Flathead Forests" (complete citations in the FEIS). Roadside clearing will be limited to retain as much shade as possible to help inhibit the establishment and success of noxious weeds. A Forest-wide environmental analysis (Flathead National Forest Noxious and Invasive Weed Control Decision Notice and Finding of No Significant Impact, May 2001) set priorities and parameters for noxious weed control. Weed treatments in the analysis area will be consistent with this strategy.

### *Revegetation with Native Plants*

In places where it is necessary to revegetate, the Regional Forester has determined that using native plant species is desirable to protect ecosystem integrity. Historically, non-native seed or seedlings were used in many cases to achieve soil stabilization or some other revegetation objective. The effect of that practice is to introduce species that might preclude establishment and persistence of species that are integral to the functioning of a particular ecosystem. It is currently the policy of Region One to collect seed or cuttings locally, cultivate, and subsequently outplant. That policy and practice will occur with any actions in the Logan Creek decision that requires revegetation to the extent that funds are available. In the event that funding is not available for planting native plants, short-lived or non-invasive non-native plants will be used.

### **Recreation**

Trail construction near Tally Lake Campground will occur to complete a short loop trail. Construction will be an extension of Trail 804 and consist of about 2000 feet of new trail. This proposed trail is shown on a map in Appendix A of this document.

### **Visual and Scenic Resources**

The following are examples of techniques that will be used to manage the effects of timber harvesting and fuels management on the appearance of the landscape. Implementation of these techniques will help ensure that scenic resource goals are met. These techniques are based on viewing distance zones.

**Foreground viewing zones:** "Foreground viewing zone is based upon distances at which details can be perceived. It would usually be limited to areas within 1/4 to 1/2 mile of the observer, but must be determined on a case-by-case basis" (from Handbook 462 of the Visual Management System). The following guidelines will be used in foreground viewing zones:

- Use whole tree removal.
- Designate skid trails to angle away from line of sight.
- Sever stumps as close to the ground as feasible or angle cut away from viewers in the Tally Lake Campground area, adjacent to trails, and along road 2895.
- Protect screening vegetation between campsites.
- Above road 2895 in burn #200, reduce or eliminate ladder fuels by cutting smaller trees (3 to 4 inches DBH and less), pruning and hand piling them before under burning in order to reduce the potential for bole and tree crown scorching. This technique could also reduce the potential of beetle attacks on the large Douglas-fir trees by putting less stress on them during underburns.
- Dispose of burn piles during the same or second year of operation.
- Reduce the amount of road frontage burned at any one time.
- Leave unburned islands.
- Use backing fires to reduce fire intensity and minimize bole and crown scorching.
- Place hand piles back from the edge of roads and behind natural screens.



- In harvest units that have trails passing through them, protect the trail tread and leave some trees for screening adjacent to the trails.

**Middle ground and background viewing zones:** "Middle ground is defined as the zone which extends from the foreground viewing zone to 3 to 5 miles from the observer. Individual tree forms are usually only discernible in very open or sparse stands of trees. Background is defined as the distant part of a landscape or the area located from 3 to 5 miles to infinity from the viewer" (from Handbook 462 of the Visual Management System). The following guidelines will be used in middle ground and background viewing zones:

- Leave trees (10 to 180 trees per acre) and clumps of trees, thus minimizing visual contrasts.
- Shape units to merge with topographic features.
- Feather unit edges with partial cut prescriptions where feasible.
- Locate units adjacent to older cutting areas to minimize visual contrasts, link units together, and connect them to existing natural openings.
- Duplicate shapes of natural openings.
- Use prescribed fires to add vertical and horizontal diversity.

### **Cultural Resources**

Field investigation in accordance with the National Historic Preservation Act is ongoing. This includes consultation with the State Historic Preservation Office, the Advisory Council on Historic Preservation, and local Native American tribes. Special timber sale contract provision "B6.24# Protecting of Cultural Resources" will be included in the timber sale contract to assure protection of cultural sites. One Indian scarred tree site is located in the analysis area and could be affected by a proposed activity. Treatment methods to protect the scarred trees have been developed and will be implemented at the time of treatment.

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## APPENDIX C: MONITORING for the SELECTED ALTERNATIVE

Monitoring is the process of gathering information and observing management activities to provide a basis for periodic evaluation of Forest Plan goals and objectives. The purpose is to determine how well objectives have been met and how closely management standards have been applied during the timber sale activities. Evaluation of the monitoring results will assist in the review of the conditions of the land as required by National Forest Management Act regulations. It may result in decisions for further action, such as modifying management practices.

There are three basic types of monitoring:

- (1) **Effectiveness Monitoring** is used to determine if management practices as designed and executed result in the desired resource condition.
- (2) **Implementation/Compliance Monitoring** is used to determine if goals, objectives, standards, and management practices are implemented as detailed in the Forest Plan, this FEIS, or by other State or Federal agencies. This will be performed by contract administrators, the interdisciplinary team, and resource specialists.
- (3) **Validation Monitoring** examines the quality of the data and assumptions used in the analysis process.

Several sources of funding exist for resource monitoring. Many items will be funded with Knutson-Vandenberg (KV) funds, while other items will be funded with appropriated funds. No assignment of funding source to the monitoring will be made at this time because future availability of funds is unknown. Priorities for annual monitoring are established and agreed upon by the Interdisciplinary Team and the Responsible Official, and implementation will be based on annual budgets and program direction. All legally required monitoring will be performed.

Monitoring and evaluation of this proposal will be conducted according to the requirements outlined in the Implementation and Monitoring section of the Forest Plan on pages V-7 through V-21. In addition, monitoring activities specific to the Logan Creek proposal will be conducted. Monitoring activities will be discussed by environmental component, consistent with those used in the FEIS. Those components not specifically discussed tier to the monitoring described in the Forest Plan.

### **Soils**

*Effectiveness Monitoring.* Forest Service Region 1 Draft Soil Quality Standards, 1999, states that at least 85 percent of an activity area must have soil that is in satisfactory and productive condition. This same document describes conditions that are not satisfactory. To determine if this direction is met, several units of the Selected Alternative will be monitored. Monitoring will be concentrated on units with sensitive soils and severe erosion risks. These units are at a

higher risk of exceeding the soil quality standards. The following units of the Selected Alternative will be monitored: Units 21, 24, 25, 26, 42, 101A.

These units represent a cross-section of the management activities that will occur and will span the entire time frame for the project (approximately 10 years). Monitoring will follow the process outlined by Howes found in Project File Exhibit H-21. Monitoring will consist of random transects across the units. The condition of the soil surface will be recorded. Along with the condition of the soil surface, the amount of large woody debris and the percent organic cover will be determined. The objective for monitoring is to see that the productive potential of the land is maintained at a minimum of 85 percent of natural conditions.

*Implementation Monitoring.* District fire personnel will monitor moisture conditions to ensure that burning occurs when soil and duff moisture content promote fires that maintain organic matter and nutrients on the burned areas.

For units harvested by mechanical means (dozers, skidders, etc.), soil moisture levels will be monitored by the Sale Administrator to ensure that logging, fuel treatment, and site preparation activities are conducted during periods when soils are below the recommended moisture content and less susceptible to compaction. Effects of logging on soils in units harvested by mechanical methods will be monitored by on-the-ground review.

### **Vegetation/Timber Management**

Reforestation surveys will be conducted for each regeneration harvest unit. Surveys will occur at a minimum during the first, third, and fifth year following completion of the initiating activity for reforestation (site preparation or planting). This monitoring is necessary to assure adequate stocking levels for stand certification (Flathead Forest Plan, Appendix I). Funding for this monitoring is assured because it will be incorporated into the Knudson-Vandenberg trust funds of the timber sale contracts.

Surveys will be conducted on all units before and after site preparation and fuel treatment activities are accomplished. These will perform the dual purpose of determining whether fuel management and site preparation objectives are met and to gather data on the current condition of stands for planting needs.

All harvest activities will be monitored by Forest Service Representatives to ensure compliance with contract specifications. Minor contract changes or contract modifications will be enacted, when necessary, to meet objectives and standards on the ground.

Timber sale layout, harvest unit prescriptions, and timber sale contract provisions will be reviewed by a district management team to determine compliance with Forest Plan and FEIS goals, objectives, and standards prior to sale award.

Assessment for any further noxious weed treatment will occur a few years after road reclamation activities.

**Wildlife**

Quantities of snags and downed logs will be monitored to determine if timber sale and site preparation activities maintained appropriate levels of present and future large woody debris. This should be done after the first several units are harvested in each sale.

Monitoring of species associated with old growth will occur in accordance with Amendment 21 to the Forest Plan.

The timing and effectiveness of road closures will be monitored, and closure structures will be maintained.

Forage enhancement from activities such as underburning and shrub planting will be monitored.

**Roads**

Forest Service representatives will monitor all road construction and road maintenance to ensure compliance with specifications and to meet the intent of management practices. Specifications will be designed to meet objectives and management practices.

The Forest Service Representative will monitor the work performed by the Contractor to ensure that their methods of operation and work are in compliance with the specifications that were designed to meet the intent of the management practices. If the designed work is not meeting the objectives and management practices, a modification may have to be made by the Forest Service Representative to change the work to meet the objectives and management practices.

**Watershed and Fisheries**

Potential sediment sources (such as stream crossings and road construction/ reconstruction) in the sale area will be monitored to assess the need for stabilization to protect habitat for cutthroat trout and other aquatic species. Areas of disturbed soil as a result of logging and road reclamation will be monitored for revegetation.

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